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Printed in U. S. A.

Products finishing Contents

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Products Finishing

Cooperation Is Attainable

The finishing department is an important one in product manufacturing and the economies of its operation are of sufficient scope and complexity to justify careful study, to warrant high quality supervision, and to require cooperative effort to accomplish and maintain a high degree of efficiency. The lack of cooperation among engineers, foremen, and control specialists, as well as between research men and designers, can go further towards reducing efficiency in the finishing department than perhaps any other single factor.

Although it is generally recognized that the foreman is primarily responsibile for what goes on in his department, certain functions which he is called upon to perform may be organized, and even controlled and supervised, to a helpful degree by some of the cooperating service departments in a manufacturing organization. A study of the overall layout of the finishing department, and planning so that the operations will follow in logical sequence represents a source of economy in finishing operations which is of real significance. Also, careful planning in the handling and processing of products after the final finishing operation usually pays dividends from the standpoint of elimination of expensive touch-up painting.

If the finishing foreman receives an accurate report from the cost accounting department each month as to the amount of money spent for materials, labor and maintenance, together with an estimate based on management appraisal of the amount of work accomplished, he will have the opportunity to analyze the operation of his department and determine which operations must be improved.

When special problems arise, it may be desirable to seek the cooperation of the industrial finish manufacturer who is in a position to study the problems of the finishing department as they arise, and who, after careful consideration of the operations involved, can provide added assurance that finishing is being done in the most efficient manner at all times.

FINISHING OPERATIONS at Studebaker PACIFIC PLANT

By FRED M. BURT

PASSENGER car bodies are shipped into the 310,000 square foot plant of the Studebaker Pacific Corporation, Los Angeles, from the main plant in South Bend, Indiana, assembled and with the red primer and surfacer coats already applied. The Pacific plant has two major finishing lines, one for bodies and one for fenders, hoods, and small parts, as well as two smaller lines for special small parts and for the painting and striping of wheels.

With the production controlled by the "line setting" of schedule from the sales and production offices, the car bodies are placed on the end section of the No. 1 conveyor. A large, special handling fixture on an overhead monorail is used to pick the bodies up from the large storage area nearby.

The bodies are first inspected for transit or handling damage, and any necessary repairing is done in the first 90 feet of travel. The surfacer coat are then sanded with No. 320 wet o dry sandpaper, as shown in Fig. 1 Body top sanding is performed by me working from the elevated side plat forms, with side and rear sanding op erations executed by men at floor lev els. To add to the working convenienc of the men on the floor, the conveyo is raised from the floor throughout th 95-foot length of the wet sanding deck

From the wet sanding deck the bod ies are conveyed through an 80-foo long dry-off oven for a 50 minute dry ing at 275 deg. F. They are then move across a wide aisleway for a paralle return travel on a floor conveyor chain, after which the bodies are carefully inspected for any spots revealed by the sanding that may require grinding or other metal repairing. These areas are chalkmarked by inspectors and repaired, as illustrated in Fig. 2. After the re-work, a spray of spot primer is

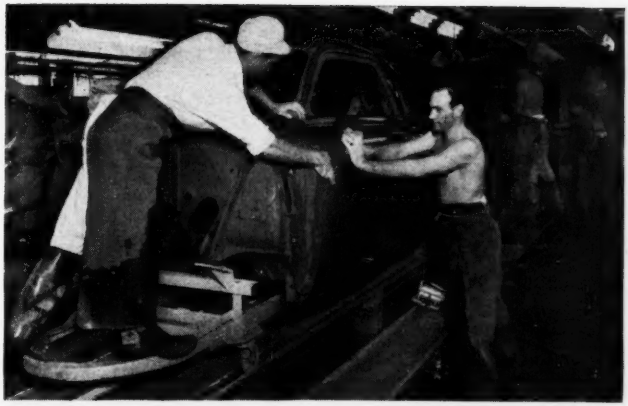

Fig. 1—Studebaker passenger car bodies on 95-foot long wet sanding deck elevated for convenience of workers; in background tops are sanded from elevated platforms.

applied to the small bare areas. These sprayed areas are given a light sanding after which the bodies move onward through an oven for a 30 minute baking at 300 deg. Fahrenheit.

The next production line operation is dust sealing wherein a special sealing compound is used to fill and seal every body seam, inside and out, the compound being supplied through a flexible hose under 100 lb. air pressure from a 200 gallon tank. The equipment used in applying the compound is of Binks manufacture, as are all of the spray guns, accessory equipment, mixing and pressure tanks used in the plant. Following the dust sealing operation a deadening or silencer compound is applied to the bodies from a large pressure tank filled with an agitator. An enamel sealer is applied to the front dash, to all door facings and wheel housings, and to the underside of the trunk lid. After a naphtha wash

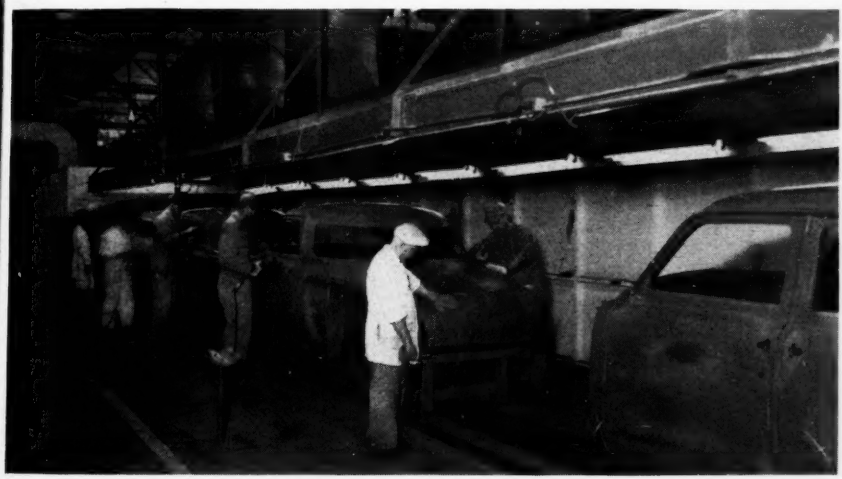

Fig. 2—Inspectors examine car bodies after wet sanding and drying, chalkmarking areas that require further attention such as grinding, metal repairing, and spot priming. Bodies then move on into oven at left.

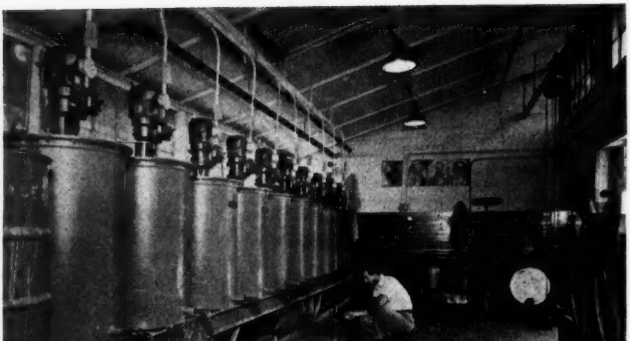

Fig. 4—At left are Binks tanks with motor-driven mixers and heat controls; Willard George, in charge of paint mixing, is shown making a viscosity test with No. 4 Ford Cup. Roller mixer in right background.

and a resin sealing of all solder joints, the bodies are conveyed through another oven for a 20 minute bake at 300 deg. Fahrenheit.

Upon emerging from the baking oven, the car bodies are sent to the tack-off room where all surface areas that will receive finish coats are wiped off with tack rags to remove every tiny particle of dirt that may have been picked up by the bodies. The tack rags are dipped in a clear tack varnish of such a consistency that the rags have a slight "stickiness" that will serve to pick up the particles but will not cause the rags to cling to the metal during the wiping operation. The tack-off room is an extension of the air-conditioned, pressurized spray-room, with the bodies traveling through a 180-degree turn around the end of the wall dividing the tack-off area from the sprayroom, in which the bodies receive successive, final coats of color enamels, as shown in Fig. 3.

Ten standard exterior colors are used on the many dozen "Champion," "Commander," and "Land Cruiser" Studebaker passenger car bodies that pass through the sprayroom each day.

Fig. 3—Spraying finish color coats on car bodies. Note staggered arrangement of water wash units with off-spray drawn down through grille work floor and out through water wash. Fresh air pumped back into sprayoom is water washed. In far background bodies leave sprayroom to move into bake oven.

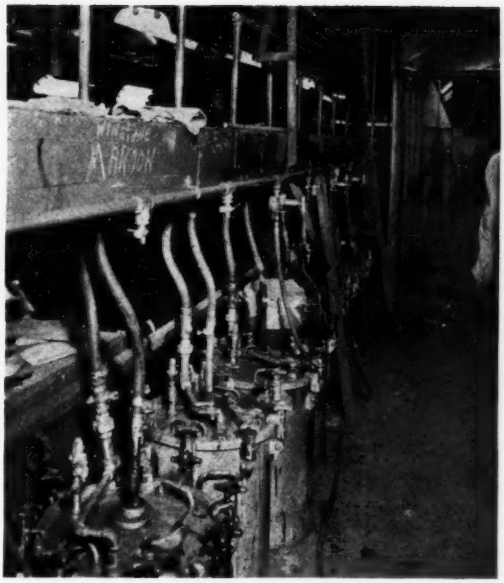

Fig. 5—Pressure tanks containing enamel for finish spraying of car bodies (sprayroom shown right background). Note agitators in each tank operated from a common drive unit; also, piping system running to spray gun outlets in sprayroom.

Several special colors are also used in such instances where a customer company in buying a number of passenger cars desires that they be finished in the company's own distinctive color or colors.

From the sprayroom the bodies are moved directly on the Link-Belt conveyor chain into a long oven for a one-hour baking at 250 deg. F. After careful inspection, the bodies then enter the trim department to receive final interior trim, glass, and body hardware before being conveyed to the final assembly line.

A view of the paint mixing room at the Studebaker Pacific Corporation is shown in Fig. 4. Adjacent to this room is a large storage area for 55-gallon drums of enamels and lacquers. When required, as dictated by production schedules, the drums are taken

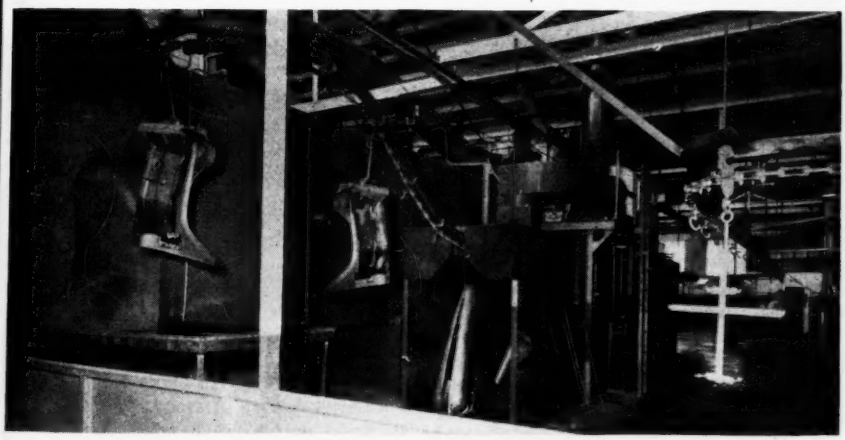

Fig. 6—At left parts are coming from chromic acid spray to enter dryer and move on to transfer area for placement on spray line conveyor. Primer and surfacer spray booth in right background.

Fig. 7—Between primer bake oven at left and finish coat sprayroom at right conveyor carries hoods, fenders, and small parts through sanding, compressed air blow-off and naphtha washing operations.

from storage and placed on rollers to be revolved for about an hour to assure a very thorough mixing of the contents. Each drum is then moved, with a hoist traveling on a monorail carrier, to an emptying rack where the viscosity of the enamel is checked before discharge into containers for transferal to large Binks mixing tanks equipped with motor-driven agitators. The emptied drums are washed out with a synthetic thinner, which is also used as an addition to that same enamel in the agitator tank to bring it to the required viscosity.

The viscosity standard set up for each specific enamel is checked with a No. 4 Ford Cup (viscosimeter). An absolute and continual adherence to the strict standards must be maintained so that bodies, hoods, fenders, and various small parts match exactly on the assembled cars, even though sprayed and baked at different times and at different places. With the proper viscosity attained, the enamels and lacquers are maintained at an 80 deg. F. temperature by thermostatically controlled, electric heating units on each Binks tank until withdrawn for use. Enamels are also strained through organdie cloth as a final safeguard in removing dirt particles.

Finish coat enamels, after preparation in the mixing room, are placed in agitator-equipped pressure tanks in a row close to the finish sprayroom, as illustrated in Fig. 5. Each tank, under air pressure, is pipe-connected to spray gun outlets in the sprayroom. This versatile piping system allows for a quick change from one color of enamel to another.

The "white sheet metal," the uncoated hoods, fenders, and various small parts are received from the fabrication department, as per the "line setting" in complete unit sets, to be placed on an overhead Link-Belt conveyor for passage through the cleaning and Bonderizing unit, which is an R. C. Mahon Company installation, as are the spray booths, ovens, and some allied equipment. The parts are conveyed through six spray baths in the 90-foot long Bonderizing unit in 12 minutes in the following sequence:

1. Cleaning solution (pressure, 18 lb.; temperature, 150 deg. F.)
2. Hot water rinse (pressure, 18 lb.; temperature, 140 deg. F.)
3. Hot water rinse (pressure, 20 lb.; temperature, 160 deg. F.)
4. Bonderite solution (pressure, 14 lb.; temperature, 135 deg. F.)
5. Cold water rinse (pressure, 17 lb.)
6. Chromic acid bath (pressure, 17 lb.; temperature, 150 deg. F.)

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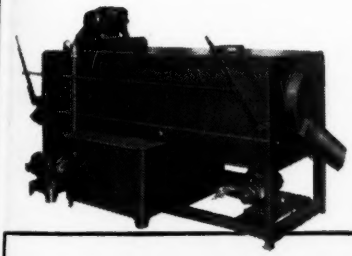

This letter was written in 1941. How is the A-F Washing Machine performing today? See Mr. Kilian's recent letter in this magazine next month. . . . Meanwhile, if you wish to discuss the most correct methods of machine washing metal parts and products write us today.

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Upon leaving the last spray bath, the conveyor makes a 180-degree turn to carry the parts through an oven for a three-minute drying at 375 deg. F., as illustrated in Fig. 6. Beyond this oven the conveyor parallels the spray line conveyor for transferal of the cleaned, Bonderized, and dried units. The spray line conveyor first carries the parts through a spray booth for the application of primer and surfacer and then makes four passes through an oven for a 45-minute baking of the parts at 350 deg. Fahrenheit.

From the baking oven the parts are conveyed for a two-pass travel through an open area, as shown in Fig. 7, where they are sanded, air cleaned, naphtha washed, and tacked off before moving into a 100-foot long sprayroom. In the sprayroom the parts pass in front of three water wash spray sections for the application of three coats of finish color enamel, as illustrated in Fig. 8. The entire room is air-conditioned and pressurized, with the pressure always outward so that no dirt particles can be drawn into the room.

From the sprayroom the conveyor moves the parts immediately into a two-zone, four-pass oven for a 60 minute bake at 250 deg. F. From the oven the parts are moved through a transfer area for careful inspection and transfer to another overhead conveyor which delivers them to the final assembly line. The delivery conveyor also picks up parts from the other side of the plant where there is a smaller sprayroom with its own overhead conveyor which also runs through an adjacent small oven. This equipment is used for various small and special parts and for touch-up work.

Wheels are received from the manufacturer with the primer coat already applied and are placed in storage close to the wheel-spray overhead conveyor. According to production schedules, the wheels are then placed on special hanger fixtures to be conveyed through

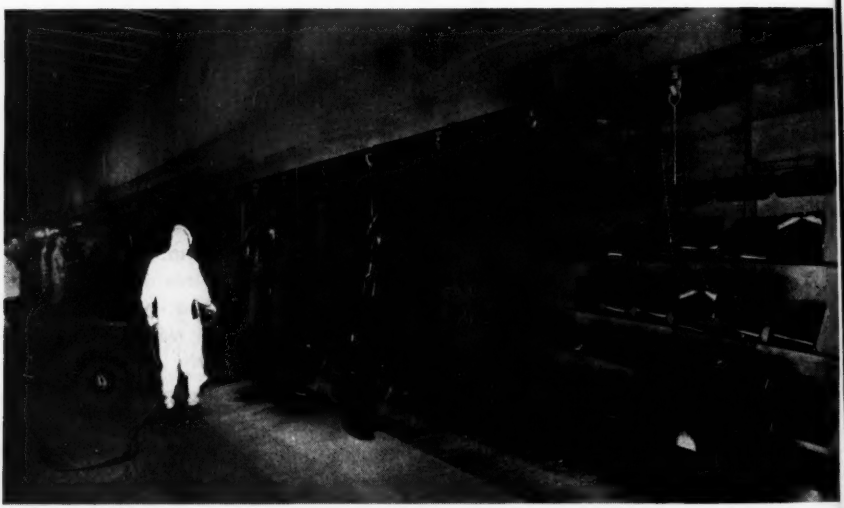

Fig. 8—Long Mahon water wash sprayroom where spray painters are applying three color finish coats on hoods, fenders, and small parts. Off to right conveyor makes 180-degree turn for travel through two-zone, four-pass bake oven for a 60-minute bake at 250 deg. F.

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MANUFACTURERS OF INDUSTRIAL FINISHES

a long, narrow sprayroom for the application of color coats and then into a bake oven. The fixtures each accommodate four wheels, two on each side, one above the other, and are mounted on short ball-bearing axles so that when the sprayer gives the wheel a whirl, it keeps on turning until he can apply the complete coating. This operation is repeated for spraying the other wheel on the one side. A second spray operator performs the same job on the other side of the fixture. In this way, two operators are able to spray all wheels that the conveyor moves in front of them. The conveyor, as with all others mentioned, has a variable speed drive. Thus, all conveyor speeds can be set to conform to production schedules. After spraying and baking, the wheels are striped by a machine and by freehand.

All plant operations of the Studebaker Pacific Corporation are highly mechanized for handling parts in work and in assembly. All of the many conveyor lines are set at production speeds that synchronize one with another so that large banks of parts in work do not accumulate in storage areas. Production schedules are set so that the correct number of parts and sub-assemblies are scheduled to produce the required number of completed automobiles per hour and per day.

Du Pont Electrotinning Technical Service Manual. The sodium stannate-sodium acetate process of electrotinning is described in a technical service manual available from E. I. du Pont de Nemours & Co., Electrochemicals Dept., Wilmington 98, Del. The 12-page manual is divided into five parts, as follows: Practical Value of Du Pont Sodium Stannate-Acetate Electrotinning; Plating Solution—Materials; Control and Maintenance; Preparation of the Base Metal for Production of Non-Porous Deposits; and Bath Control—Analytical Methods. Copy free upon request.

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DEGREASERS

By FRANK V. FAULHABER

Oils, greases, drawing compounds, polishing and buffin compounds may be removed from metal products through th use of trichlorethylene-base solvents employed in suitabl equipment. This brief summary lists types of degreasers, an discusses some facts in connection with the design, selection installation, and operation of the units.

IN the preparation of metal for the application of paint or electroplated finishes, degreasers play an important part. Their meritorious performance is recognized in various industries, for the cleaning of large machinery, sheet metal work, stamped, formed, and fabricated metal products, in addition to small items such as bolts, nuts, screws, and bearings. Degreasers have an outstanding role, too, in the cleaning of electric motors and motor generator sets. Serviceable, too, are degreasers for use in softening certain types of plastics in preparation for forming.

In the finishing industry, where the quality of the finish, and consequently the life and appearance of the product are dependent upon proper preparation of the metal surface prior to the application of the finish, the use of degreasers aids the finisher in preparing metal for rust-proofing, painting, electroplating, and anodizing.

The general principle of the solvent vapor degreaser is quite simple. Ge erally, a trichlorethylene-base solve is boiled in the bottom of a steel tan and the resulting vapor fills the tan interior. When metal parts are su pended in the vapor, the vapor co denses on the surface of the work a falls back into the bottom of the tan carrying with it oil and grease di solved from the surface of the work. water jacket and/or cooling coil loc ted around the sides of the tank, ne the top, condense almost all the vap before it can leave the tank.

Operating by steam heat, gas electricity, degreasers of proper capa ity are procurable, whether the lo to be processed is 10 pounds or 1 tons. Representatively, open-type v por degreasers are available in siz ranging from 1½ up to 12 feet length, or even longer; especially bui conveyorized units are available i sizes of 100 feet x 10 feet wide x 2 feet deep. The units are equipped wit automatic controls and safety device for increased operation efficiency an

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The Ertel Disk Filter is designed so that reloading or cleaning consumes but a few minutes time. Filter rings are rigidly constructed for positive seal protection. Standard portable unit is furnished in stainless steel unless otherwise specified.

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operator safety.

Convenient for the smaller shops are portable degreasers which can be trundled readily to different jobs and connected to the necessary utilities. A simple plugging into the available power line is all that is required for electrically-operated machines. A small degreaser may also prove economical for plants which require occasional operations at various locations.

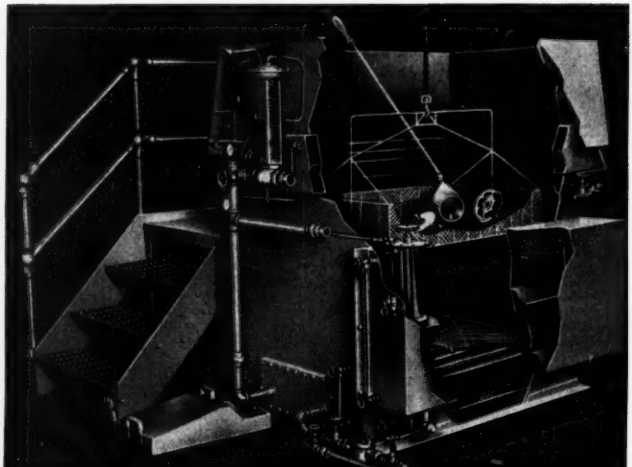
The range of degreasing operations includes vapor, vapor-spray-vapor, warm liquid-vapor, boiling liquid-warm liquid-vapor, and individual variations of these types.

A simple vapor-phase degreaser will prove serviceable for cleaning comparatively heavy metal parts which are coated with light oil or grease. In the vapor method of degreasing, workpieces to be cleaned are lowered into hot solvent vapors in a manner so that they will be steadily washed with chemically pure solvent which condenses on the cool metal surfaces. This process continues until the temperature of the work equals that of the vapor, after which cleaning action stops. Only clean solvent can reach the work, no matter how contaminated the boiling solvent in the chamber underneath becomes.

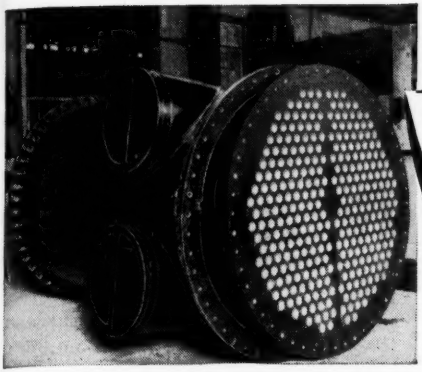
Immersion degreasers usually consist of either two or three chambers. The cleaning procedure in these units consists of immersion of the work in the boiling solvent to remove heavy contamination, in clean solvent in order to rinse and cool the metal, and then in pure vapor for final cleaning and drying. Light gauge metal parts, because of their low heat capacity, are readily degreased with two and three-stage immersion machines.

In a two-chamber degreaser, the second or cool chamber (separated from the first or boiling chamber by a low dam) collects the condensed vapor as it drops from the water-jacketed condenser zone. It thus functions as a reservoir for clean solvent which, in turn, is constantly flowing over the dam into the heating compartment. The solvent in the heating chamber will become contaminated in the course of time, but that in the rinse chamber remains relatively clean, being constantly supplied with pure condensed vapor.

In the second or rinse chamber, the temperature of the liquid solvent is below that of boiling solvent in the heating compartment and also that of the vapor above. This temperature va-



This illustration comprises a cutaway view of a hand-operated vapor-spray solvent degreaser, showing internal operating mechanism. *(Photo courtesy Detrex Corp., Detroit, Mich.)*



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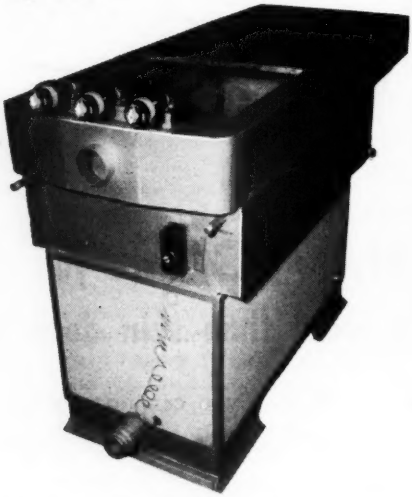
riance is maintained by an air space separating the chambers. Immersion of the work in a second chamber reduces its temperature so that a final cleaning can be accomplished in the pure vapor prior to removal from the degreaser.



Straight vapor manually-operated degreaser (D'Oiler) for degreasing small parts. The unit is electrically heated and completely fitted with the necessary electrical controls as shown in the photograph.
(Photo courtesy Mechanical Process Co., South Orange, N. J.)

To provide straight-line operation for the boil-rinse-vapor cleaning cycle, a three-dip degreaser is especially applicable. The third chamber contains vapor only, and the condensate is returned to the boiling chamber by gravity or by means of a pump.

Oftentimes it is more expedient to rinse partly cleaned work by immersing it in a vapor chamber. To obtain an effective rinse in vapor, the work in process should be below the temperature of the vapor when it is withdrawn from the liquid compartment. This procedure requires that the solvent in the liquid chamber be operated below 180 deg. F. (the approximate temperature of the vapor is 188 deg. F.). It is the practice of some operators to control the time of immersion in the liquid so that the immersed articles are left in contact with it for a length of time insufficient to heat them to the temperature of the solvent. When a degreaser is operated manually and this system is employed, there is the possible disadvantage of inaccurate timing and consequent lack of uniformity of operation.

In the vapor-spray-vapor degreaser the act of spraying acts like the intermediate cooling dip to provide the required temperature differential necessary for the final vapor rinse. Specifically, the spray method is particularly serviceable, and in cases where quantity production is the aim, where the cleaning action actuated by the roll of boiling solvent is insufficient to completely remove insoluble materials, such as buffing compounds, from the surface of the work.

The vapor-spray-vapor type of degreaser provides positive and effective removal of caked-on substances. Using this system, the work is wet initially with the solvent vapors. Then, warm solvent is pressure-sprayed onto the work, thus mechanically dislodging and driving off the solids. Incidentally, this high pressure, force-spray system is not to be associated with the ordinary flushing type of apparatus. In sequence to the spraying operation, a final vapor rinse is applied.

When the finishing management strives for quantity production, automatic type degreasers with independent conveyor or a continuous monorail, built to accommodate the general plant process flow, offer many advantages. Automatic equipment of this kind can be constructed so that the loading and unloading are effected at a single end opening; or, the conveyor may receive loaded baskets at one end, discharge

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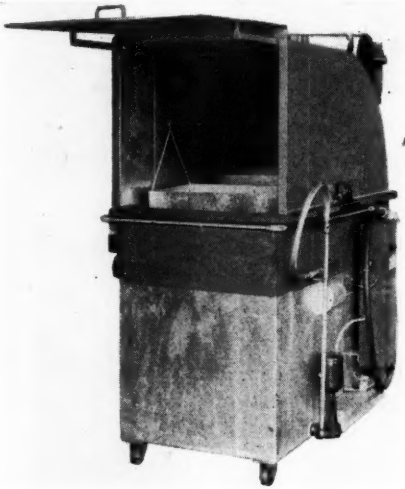
them at the other, thence returning to the loading point.

Solvent Stills

Degreasers are equipped with various means for distilling the solvent from one reservoir to the other when cleaning is necessary. Some machines have tapered channels below the cooling coils, sediment chambers, removable chip baskets, and cleanout doors. Gas and electrically-heated degreasers can be provided with thermostats



Portable vapor degreasers of the type illustrated herewith are receptive to a variety of smaller parts and are handy for transferring to different jobs or departments as required. *(Photo courtesy Phillips Mfg. Co., Chicago, Ill.)*

which turn off the heat in case the temperature, by reason of oil contamination, should rise too high. The reclaimed pure solvent distillate may be stored separate from the contaminated solution in a chamber within the machine, in an attached storage tank, or in a separate drum. Most degreaser units have an interior clean solvent condensate trapping area whereby the clean solvent can be withdrawn into receptacles as required. The residual oil and negligible amounts of solvent remaining in the central sump, however, are invariably transferred or removed by means of a drain or a pump.

In operating degreasing machines, continuous distilling is advisable whenever the volume of oil removed is large, in order to maintain maximum purity of solvent. Standard sizes of stills will distill from 10 to 150 gallons per hour, depending upon the solvent content of the degreaser, and will reclaim the oil removed from the work. The individual stills and recovery systems for distillation of the contaminated solvents permit such recovery without stopping operation of the degreasers. Moreover, residues are piped directly to the still from the degreaser, thus avoiding most cleanout operations and handling by the operators.

Installation

Advice from a representative of the degreaser manufacturer should be enlisted when installing the machine. This will ensure correct location, proper heating and piping connections and location of safety devices. A well ventilated, open room should be selected if possible.

Aside from ventilating pits, exhaust ventilation ordinarily is not essential. Nevertheless, whenever safe, practical operating conditions are in question, suitable ventilation should be furnished. The manufacturer of the degreaser unit is in the best position to suggest the most appropriate exhaust means for his particular machine.

In setting up a degreaser in a pit, an exhaust boot can be constructed to lead to the bottom of the pit to provide sufficient air change in the pit. The intake of the exhaust should be situated at the lowest point in the pit and as near as possible to the cleanout door. A pit large enough to provide for

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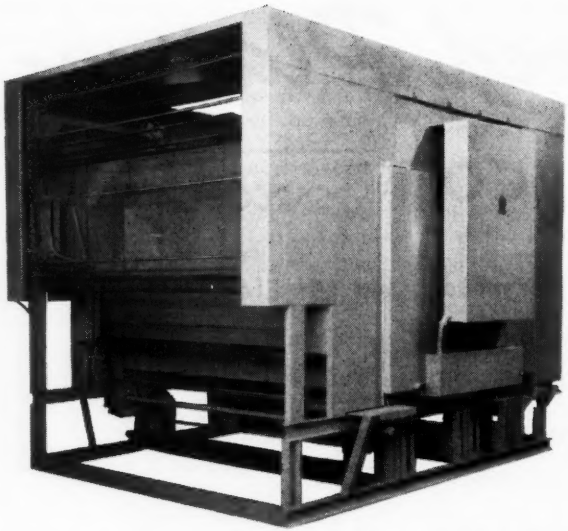

Automatic small parts vapor degreaser with built-in parts handling baskets (*Photo courtesy Optimus Equipment Co., Matawan, N. J.*)

convenient access to all cleanout doors and heating elements is desirable. For maximum efficiency and clean operation, the pit should be built with a suitable drain to the sewer. A sump pump will serve in lieu of a drain.

Installation of the degreaser should be such as to minimize drafts from open windows, doors, fans, unit heaters, or ventilators. Invariably, drafts cause undue loss of solvent vapor from the degreaser. Appraisal of the variance of normal circulation of air from direct shafts is suggested, since natural, mild circulation of air will merely disperse negligible amounts of solvent vapor which escape from the top of the degreaser. Vigorous drafts, however, will force vapors from the machine.

Users of degreasers should provide for an uninterrupted supply of water for condensing purposes. The water outlets from condenser jackets or coils should not be connected directly to sewer lines, but should drain into an open sight device such as a funnel. Back pressure and succeeding condenser trouble is thus prevented. A connection of this kind also provides a convenient means of ascertaining water flow and outlet temperature.

In selecting a degreaser, the dimensions, mass production volume, and method of racking of the product or parts for top performance and economy are influencing factors. Sound practice requires a degreaser affording additional height or freeboard above the vapor level. The height of the freeboard should not be less than one-half the operating width of the unit. To lessen escape of vapors induced by surrounding air movement, special installations may require a greater height or the use of shields near the degreaser.

To ensure heating of a predetermined maximum work load, including racks or baskets, in the specified time under the most adverse conditions, adequate heat input is essential. Heat input should be sufficient to provide for requirements for internal distillation, besides compensating for normal losses resulting from radiation, convection, and so on. A cardinal principle of this process is that the work, before being removed from the machine, should be heated to the temperature of the vapor. Following such procedure, the adhering solvent is not wasted. Whenever work is withdrawn before it reaches the correct temperature, the desired drying effect will not result immediately and the solvent will evaporate into

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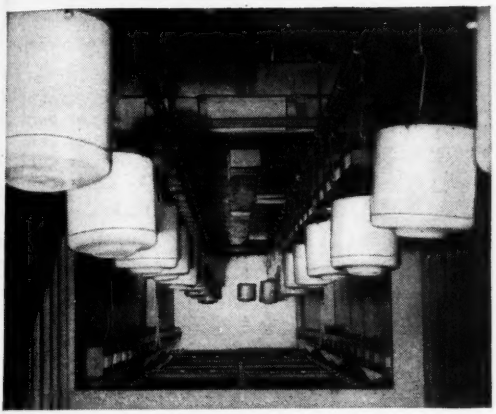

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RADIANT HEAT GAS SYSTEMS

the air and be lost. Heated to the proper temperature, the liquid adhering to the work will vaporize into the saturated vapor column immediately following removal from the liquid solvent. Hence, it is essential to supply heat to the degreaser at a rate so that the work will be heated to the required temperature in a reasonable time.

Adequate condensing surface is required around all four walls of the degreaser, in order to condense all vapors generated by the maximum heat input of the installation. The degreaser walls should form a part of the condensing surface. Thereby, a cool freeboard is always assured, preventing serious loss of vapors due to convection currents.

As in the case of all plant equipment, careful selection, installation, and operation of degreasers in a finishing plant will act to ensure economical and satisfactory production performance.

Alkyd resins have been finding increasing use in the fire resistant coatings and finishes. A recent example is indicated in "Chemical Industries" (63:319, 1948). Here it is noted that the Bureau of Standards and Appeals of New York City has approved an incombustible decorative finish for interior surfaces. The decorative coating is formed by applying an adhesive to the surface and then spraying on specially prepared fibers.

The adhesive, which is itself fire-resistant, may be made from:

Alkyd vehicle	45-55	per cent
Inert pigments	15-17	per cent
Metallic carbonates	18-28	per cent
Metallic borates	4-6	per cent
Antimony oxide	4-6	per cent

Built for processing a wide range of work, this large vapor-spray-vapor degreaser is claimed to be especially useful for quantity production.
(Photo courtesy G. S. Blakeslee & Co., Chicago, Ill.)

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Foremanship

By ROLLIN H. WAMPLER

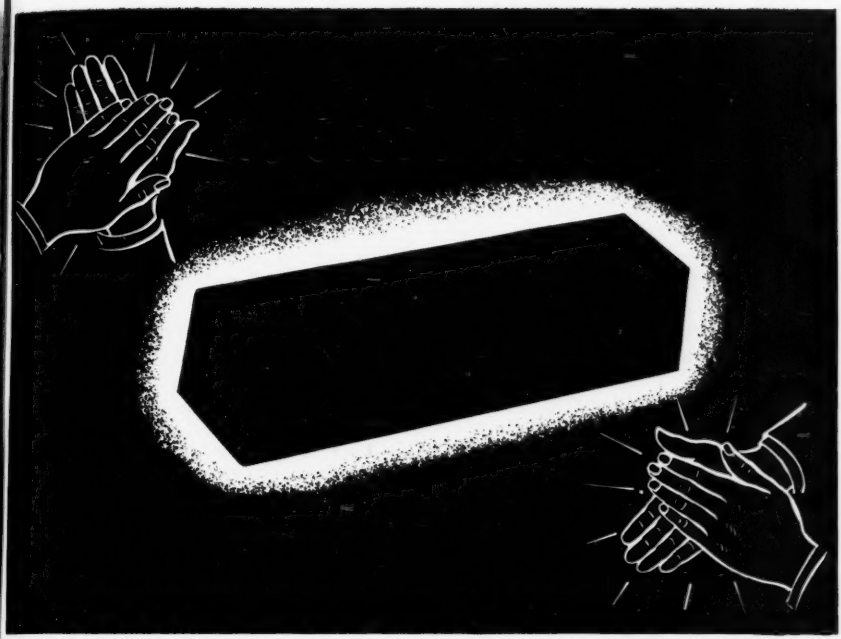
THE finishing superintendent occupies an important position on the production staff. Technical proficiency alone does not fit a man to adequately discharge his duties in such a position, important though it is. Equally important, or perhaps more so, are the qualities of leadership which enable him to supervise and direct the men who look to him for guidance, and the qualities which enable him to cooperate with foremen in other departments. These qualities are the subject matter of this article.

But first it might be well to consider as a background the important relationship between authority and responsibility. Responsibility is always earned and assumed; it is never conferred by arrangement. Management can go no further than provide the opportunity. Only those individuals who assume full responsibility for their actions are fit candidates for supervisory posts. Management is always eager to develop and promote good foremen. But first the individual must feel his responsibility no matter how humble his job. An individual's responsibility comes from without as well as within. In fact, in the last analysis it comes from the individual's associates, and particularly from those he directs who respect his character, his ability, and his judgement. No one can be a successful foreman who does not earn the respect of those he directs.

Authority and responsibility cannot be separated. Authority is conferred by management, and can be exercised only when full responsibility for consequences is assumed. Further, authority can be exercised only over those whose respect one has earned. This is the democratic way in modern industry. The day of the manager whose attitude was "Do this, or else" has long since gone.

With these facts in mind, we are ready to examine the attributes of a good foreman. The first of these in importance is integrity, or character. Only the individual who is a man of his word can occupy a supervisory position for long. He must keep his promises, and must behave in all matters according to well known standards of uprightness. His workmen know that he is fair and just, and that his ability and judgement are sound. If the foreman has integrity, his men will give that extra "something" which gets out production in a pinch, for they know if he says they must get out a particular job by a given deadline, then that is the way it is. They do not waste time figuring out ulterior motives. Integrity in a foreman does more to breed respect and confidence than almost any other quality he can have.

Ability, or technical proficiency, is of course required of a finishing foreman. A thorough knowledge of the products he is finishing, of the finishing materials he uses, and of how to get the two together in the proper



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manner is the essence of ability. In popular parlance, he must "know his job." The finishing foreman must know something of the makeup of the materials he uses; but more important, he must know what they will and will not do. Much of this knowledge he learns by experience. He can also learn from others. Other finishing foreman, technical service men, and finishing materials chemists can all supplement his own knowledge, no matter how long or varied his experience. Also, trade magazines and books can be perused to keep him up to date and to increase the breadth and depth of his experience by drawing from that of others.

In addition to integrity and ability, a good finishing foreman should have tact. There are some people who seem to "rub the fur the wrong way" in dealing with their associates. Such persons usually deplore the thin skins of their associates, but that does no good because one must take people the way one finds them. Needless to say, such individuals have no place in a supervisory post. But in most cases tact can be deliberately cultivated. The way to do it is to take the place (mentally) of the man being directed, and consider what appeals will gain the most response. The ability to say "no" with a smile and graciousness, but yet with firmness, and still make the subordinate like it, is a valuable trait in a foreman. Any foreman who allows himself to become involved in an argument with his men has placed himself in a very weak position. Tact avoids arguments.

And then the foreman who is apathetic and cold can never be the real leader he should be. Nothing can take the place of genuine enthusiasm, the heart-warming interest in the company, the individuals around him, and

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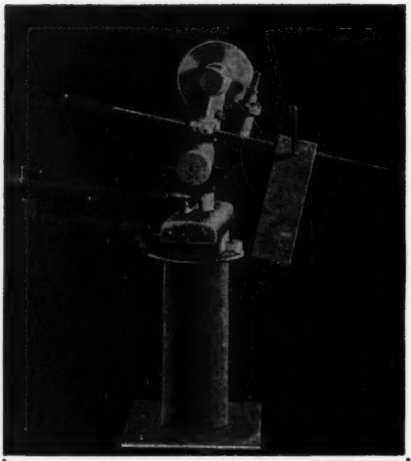

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the products they make. Genuine enthusiasm supplies the spark that sets in motion the abilities and energy of the men in the finishing department. If the foreman likes and respects his men and is enthusiastic about his work, every day is a delightful experience in the joys of teamwork. For there is no doubt that enthusiasm is the main factor in inspiring teamwork. The mood of the foreman often determines the temper of the men. If the foreman is happy, enthusiastic, open-handed, and interested in his men and in the work he is doing, he has many of the qualifications of a good finishing foreman.

Every department has times of crisis, when the qualities of leadership of the foreman comes out. And these times require resourcefulness if the foreman is to lead the way out of the difficulty. A cool head, tact, and ability are all required if the foreman is to be resourceful. At times of crisis the foreman's men will not desert him if he has earned their respect and liking. Resourcefulness is compounded of imagination, experience, and cooperation. And a little courage is involved, to be sure.

Perhaps the blueprint we have drawn seems to present an impossible ideal. But if the conscientious foreman thoroughly understands authority and responsibility, and makes a serious effort to develop the qualities of integrity, ability, tact, enthusiasm, and resourcefulness — then he need never doubt his ability to discharge the responsibilities with which he is entrusted by plant management.

Pigmented High Solids Nitrocellulose Lacquers, Outdoor Exposure Data. Hercules Powder Co., Inc., Wilmington 99, Del., has issued a booklet containing a brief review of the results obtained in an extensive study of the formulation and weathering of nitrocellulose lacquers having solids contents ranging from 26.8 to 47.5 per cent. Tables and formulas are included. Copy free upon request.

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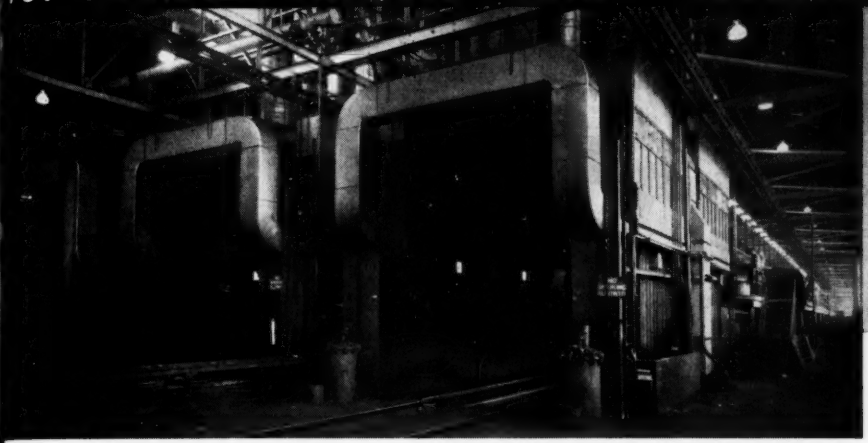

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The Mahon Finishing System installed in the Fruehauf Trailer Company's new plant at Avon Lake, Ohio, is another excellent example of Mahon Finishing Equipment engineered into a straight line production system to handle completely assembled Truck-Trailers. This complete system in the plant of the world's largest producer of truck-trailers, is 1750 feet long and consists of thirteen Hydro-Filter Spray Booths, with Filtered Air Supply, and five Finish Baking Ovens. The prime coating is done on three production lines which converge into two production lines for the finish coat painting and baking operations. If you are contemplating new, modern finishing equipment, remember that Mahon has pioneered development in this highly specialized field for twenty-eight years . . . this broad experience, coupled with constant research, has endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available to you elsewhere. Better planning, better engineering, and a better and more economical job of finishing is the result. See Sweet's Mechanical Industries File for complete information or arrange consultation.

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AHON

Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question. *We are experiencing difficulty with the formation of stain on chromium plated parts after they are processed through the hot water rinse and dried. Can you offer suggestions as to how we can overcome this trouble?* *F. A. H.*

Answer. The stains formed on the chromium plated parts are, no doubt, caused from salts or mineral hardness in the rinse water. This difficulty can be minimized by treating or softening the water used in this rinse tank. It can also be lessened by adding to the rinse water a small amount of some commercial wetting agent, such as Orvus or Naccanol. If the size of the part in question warrants, the parts may be rubbed with a slurry of whiting or Bon Ami mixed with alcohol immediately after they are removed from the rinse tank. After the alcohol dries, the whiting or Bon Ami may be dusted from the surface with a cloth, and the surface so treated will be found to be free from water stain.

Question. *I would be obliged to y if you could forward any informa concerning the finishing of collapi wood rulers.* *E. J. L.*

Answer. The standard process f the manufacture of this item is as lows:

1. Mechanical sanding operation
2. Coat the wood with a white se of either the pigmented or c lacquer type
3. Sand again to remove ra grain
4. Either spray or roller coat t a lacquer type yellow paint (th are roller coating machines a able which will coat several th sand feet of wood per hour)
5. Either air dry or force dry
6. Embossing operation, f o r m i the numbers and divisions
7. Inking operation to fill the bossed crevices with black in
8. Final drying operation

Production in the United States generally limited to the use of ce

basswood. The wood used must be nt and soft yet flexible enough and ong enough to stand some abuse.

———— f c ————

Question. *We want to purchase ee copies of a good text book on ctroplating and finishing that our ng men can study in order to be- me more proficient.* *C. I. B.*

Answer. The following books are commended as standard text books electroplating and finishing:

rinciples of Electroplating and Electroforming"
By Blum and Hogaboom, published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y.

inishing Metal Products"
By Simonds and Bregman, published by McGraw-Hill Book Co., Inc.

rotective Coatings for Metals"
By Burns and Schuh, published by Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y.

R. I. S.

———— f c ————

Question. *Recently I installed a omium plating solution in our plant I am experiencing trouble in mak- the correct adjustments to keep bath operating properly. I wonder you could provide some method or mula by which we would be able control and adjust our sulphate con- t.* *F. J. B.*

Answer. You can check the chromic d content of your plating solution determining the Baume reading on solution and referring to a table mparing Baume readings with romic acid content in ounces per llon. The sulphate may be deter- ined quickly with a centrifuge test of the type manufactured by the lour Company, Chicago, Illinois. You may find it helpful to use a plating test method such as the bent cathode test or the Hull Cell Test to determine the proper operating conditions for your solution. The bent cathode test can be performed in a suitable glass container containing approximately one quart of solution with anodes on two opposite sides. The bent cathode itself may be made by bending in 1 x 3-inch copper strip to form a right angle panel 1 inch wide x 2 inches high. In performing your plating test with this cathode, you will note that the oval unplated area at the intersection of the legs varies in size with the temperature, concentration, current density, and sulphate ratio of your solution. By varying these factors so that most of the cathode is plated and there is a minimum tendency for the building up of excessive metal along the edges, you will arrive at the proper operating conditions for your solution.

The Hull Cell Test is likewise a plating test performed in the plating test cell marketed by R. O. Hull & Company, Cleveland, Ohio. By plating test panels under varying solution operating conditions, you can again determine the proper operating conditions for your solution. A. G. G.

———— f c ————

Question. *We would appreciate any information you could furnish as to a chemical or substance that can be placed in a container holding sterling silver articles for the purpose of preventing tarnish.* *M. M. B.*

Answer. Several commercial products for this purpose are marketed and for the most part are merely moisture absorbents, such as Ascarite, which absorb the moisture from the air in the sterling silver container, and thus create conditions which reduce the rate of tarnishing of silver to a low value.

Spotlight

FINISHING Progress

New Metals for the Electroplater Offer Many Possibilities

THE advances which have been made in the metal coating industry during the past twenty years or so have been numerous and important. In the class of metallic coatings, these advances have been especially striking in the field of electroplating. Not only have plating methods been extended and applied on a mass production scale, but entirely new processes such as "bright plating" have been developed. In considering the lines along which electroplating may be expected to expand and improve in the future, Frederick A. Lowenheim, research chemist, Metal and Thermit Corporation, pointed out at least three possibilities, as a part of a paper presented before the 1948 annual convention of the American Electroplaters' Society.

The possibilities presented were: (1) The improvement of existing processes; thus, new and better solutions, faster plating, sounder deposits, more trouble-free operations; (2) the development of new and useful alloy deposits to take their place with brass, bronze, and so on; and (3) the introduction of entirely new plating metals to the electroplating industry. Dr. Lowenheim continued his discussion of future prospects along the lines of this third possibility for industry advancement.

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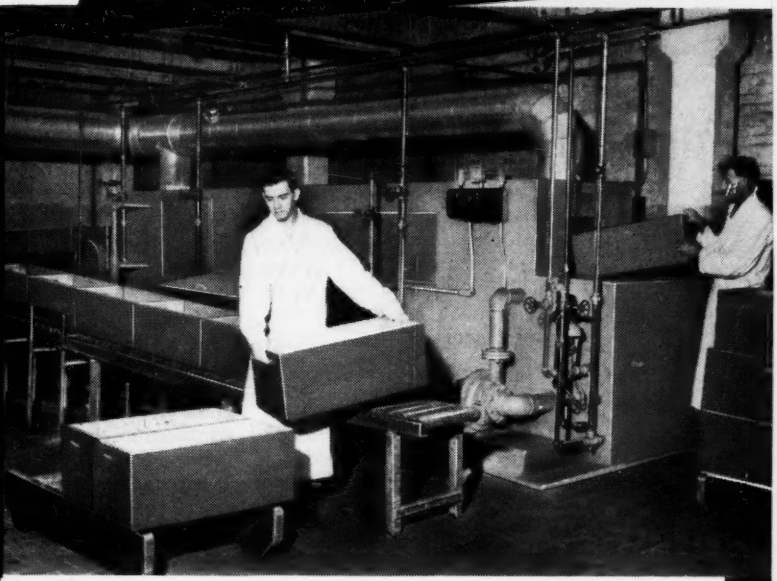

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Above installation photograph illustrates a belt conveyor type wash and rinse machine for cleaning tote pans, boxes, or food containers. Since several men were eliminated from this operation, labor costs were reduced proportionately. Then, too, the cost of the cleaning compound has dropped considerably due to more efficient operation.

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A look into present-day practice reveals the fact that the electroplating industry is engaged in laying down on various base materials coatings of just sixteen metals, singly or in combination. These sixteen are chromium, iron, cobalt, nickel, copper, zinc, rhodium, palladium, silver, cadmium, indium, tin, iridium, platinum, gold and lead. Of the 92 elements in the periodic table, or 96, if we include the synthetic, all but 19 are metals; in other words, there are 73 known metals, if arsenic, selenium, and tellurium are included. There remain then, 73 minus 16 or 57 metals in which the electroplater has, at present, no direct interest as coating materials.

Tungsten

According to Dr. Lowenheim, of all the "uncommon" metals, tungsten has probably received the most attention; however, it remains doubtful whether pure tungsten has been deposited from water solution, whereas, there is doubt that alloys of tungsten with o er metals have been plated. The pri cipal interest indicated in the most r cent work in tungsten alloy plating in the tungsten-cobalt alloys; this i terest stems from their hardness, e pecially hot.

Recent work carried out at the N tional Bureau of Standards has show that certain electrodeposited tungste cobalt alloys approach Stellite in ho hardness. The plating solution us had the following composition:

Cobalt (as chloride or sulfate)	3.3 oz./g
Tungsten (as sodium tungstate)	3.3 oz./g
Rochelle Salt	53 oz./g
Ammonium chloride or ammonium sulfate	6.7 oz./g
Ammonium hydroxide to adjust to pH 8.5	
Temperature—195 deg. F.	
Current Density—20-50 amp./sq. ft.	

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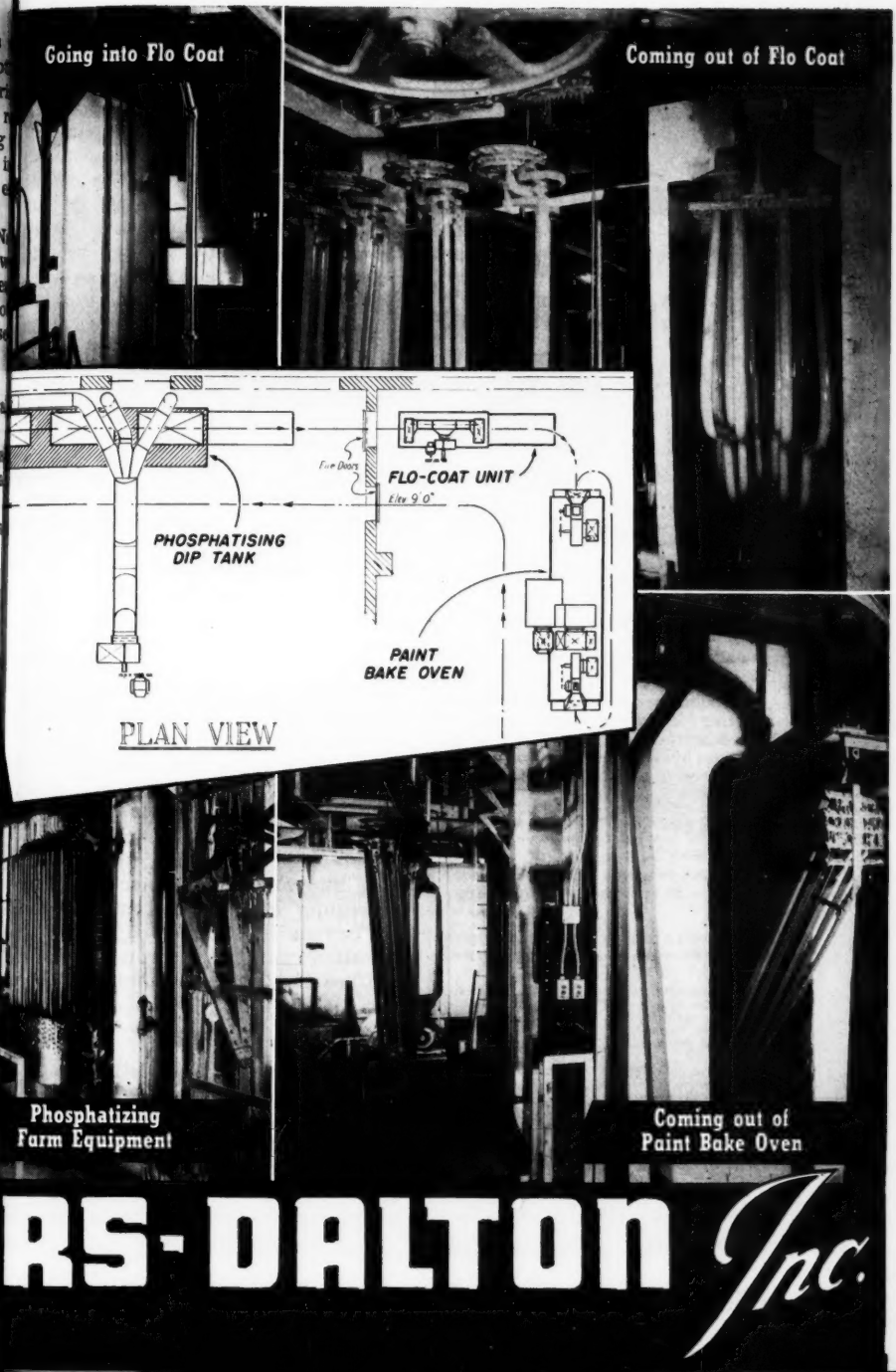
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RIGHT: Bonderite coating on metal, after ordinary cleaning. Magnification 100x. Note extreme lack of uniformity in Bonderite coating.

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A complete study was carried out on the effect of varying the concentrations and operating conditions. Deposits containing up to 50 per cent tungsten were obtained but the upper practical limit was set at about 35 per cent. The tungsten content of the deposit was reported to increase, as its concentration in the bath was increased, and as the current density was increased. The nature of the organic acid used was found to affect the tungsten content of the electroplate, as various radicals such as citrate, gluconate, malate, and glycolate were substituted for the tartrate during the course of the experimental investigation. Higher temperature was found to increase cathode efficiency, which averaged around 90 per cent. The bath investigated was found to require about one volt; anodes used may be of tungsten, a cobalt-tungsten alloy, or cobalt. It was recommended that insoluble anodes not be used because of oxidation of organic materials present in the bath.

It has been suggested that electroplated tungsten alloys may be competitive with chromium or hard nickel for building up worn parts or for use in dies. It has also been brought out that the good throwing power of these alkaline plating solutions should make the plating of many objects with tungsten alloys much simpler than with chromium, since special anodes would not be required. Suggested fields of application that have been considered are bearings, tools, pistons, cylinders and dies.

Manganese

Dr. Lowenheim stated that there is little doubt that manganese can be electroplated in the form of a coherent, satisfactory deposit. Sulfate solutions appear to be generally accepted as the preferred electrolyte, and a number of anions have been investigated. One solution that has been recommended for

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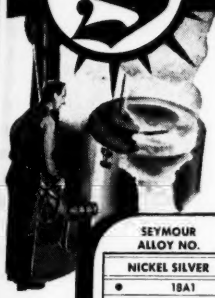

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SEYMOUR ALLOY NO.	COMPOSITION %					USES
NICKEL SILVER	NICKEL	COPPER	ZINC	LEAD	TIN	
● 18A1	18	65	17			Seymour Nickel Silver is used for flatware, hollowware, name plates, surgical appliances, drafting instruments, camera parts, springs, electrical resistance units, optical goods, television parts, slide fasteners, costume jewelry, dental instruments, architectural trim, core bars, screws, keys, screw machine and milled products, orthopedic appliances, telephone assemblies, diaphragms, ornamentation and hundreds of other uses.
● 18A4	18	55	27			
● 18X1	18	62	19	1		
● 15A	15	64	21			
● 15X1	15	60	24	1		
● 15X2	15	60	23	2		
● 12A1	12	66	22			
● 12X1	12	60	27	1		
● 12X2	12	60	26	2		
● 10A1	10	67	23			
● 10X1	10	60	29	1		
● 10X2	10	60	28	2		
● 5A1	5	68	27			
PHOSPHOR BRONZE						
● 950		95			5	Seymour Phosphor Bronze is used for springs, diaphragms, fuse clips, lock washers, thermostatic controls, studs, microphone assemblies, electrical devices, nuts, bolts, gears, bushings, pump parts, pinions, plugs, etc.
● 494		94		1	5	
● 928		92			8	
● 910		90			10	
● 444		88	4	4	4	

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manganese plating has the following composition:

Manganese sulfate	13 oz./gal.
Ammonium sulfate	10 oz./gal.
Ammonium sulfocyanide	8 oz./gal.
pH	4.0-5.5

It was reported by Dr. Lowenheim that thick deposits have been reported to give satisfactory protection, although there appears to be little decorative value.

Rhenium, a member of the same group, has been reported to be mirror bright when plated on a polished surface, and to have a high resistance to hydrochloric acid. It is also said that it can be co-deposited with nickel and cobalt. Germanium can be electroplated, but there appears to be little commercial interest in the process. Selenium and tellurium, generally thought of as non-metals, can be electroplated. According to Dr. Lowenheim, recent patent literature indicates that electrodeposits of seleniu may be useful in electronic applica tions. Considering its extreme scarci ty, it is interesting to note that a com mercial use has been reported for elec troplated polonium. Minute amount plated on spark plug electrodes ar claimed to improve their performanc

Arsenic-Bismuth-Antimony

Continuing his discussion of the les familiar metals in electroplating, Dr Lowenheim stated that there are number of satisfactory bath composi tions for electroplating arsenic. Like wise, bismuth has been the subject o considerable study, and it appears tha satisfactory processes for its electr deposition have been developed. It ha been claimed that bismuth plates hav good resistance against the usual cor rosive agents, and that the polishe plates resemble nickel.

Lowenheim reported that antimon

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can be deposited as a plated coating very easily. Furthermore, it is cheaper than any other plating metal except iron, zinc, lead, and perhaps copper. It was described as having good corrosion and tarnish resistance, and a very pleasing appearance when polished. However, against these advantages it is toxic and rather brittle. Antimony has been deposited from baths of the following anions: tartrate, fluoride, fluoborate, fluosilicate, sulfate, cyanide, sulfide, thioantimonate, and others. Antimony trifluoride as a base for plating, according to Lowenheim, has recommended itself to a number of workers in the field, possibly due to the fact that of all the simple antimony salts it probably undergoes the least hydrolysis.

Considering some of the other metals, Dr. Lowenheim expressed the opinion that it is doubtful if aluminum, magnesium or beryllium have ever been successfully electroplated from aqueous solutions. There seems to be little doubt but what tantalum, columbium, and zirconium possess properties which would render their successful electrodeposition of considerable importance. However, aside from all the drawbacks associated with methods for plating these metals, perhaps most electroplaters will agree with Dr. Lowenheim that special electrolytes, possibly organic in character, together with careful design and control may, in the future, minimize many of the difficulties, if the results from a commercial standpoint warrant the trouble.

* * *

Control and Measurement of Film Thickness of Organic Coatings

SINCE corrosion tests have repeatedly demonstrated that the thickness of an organic coating has a pronounced effect on its protective value and physical characteristics, much attention has been devoted to methods of applying films of controlled and uniform thickness. Organic finishes protect metal products by virtue of the interposition of a continuous, inert and adherent film between the surface of the metal and its environment. Thus, the factors that determine the degree to which the environment can be blocked off mechanically from reaction with the corrodible metal assume major importance. The development of automatic spray machines, controlled dipping devices, and doctor blade application methods has made possible the accurate control of film thickness in many operations.

Thus, where the resin film is a mechanical barrier, it is obvious that areas containing micro pores and other discontinuities will be non-protective. Of major importance in the application of quality finishes is the established fact that film resistivity is a discon-

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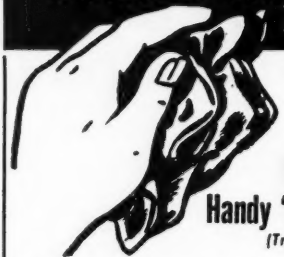

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tinuous function of the coating weight and that for every metal surface there exists some finite coating weight which must be exceeded before continuous films are formed. This minimum weight of resin coating is not constant for all metals, but varies depending on the characteristics of the surface being coated.

Variations in thickness are generally recognized to have a pronounced effect on the behavior of most organic coatings. Internal stresses produced by the development of structural gradients or by uniform shrinkage effects vary greatly with thickness, and these, in turn, influence the exposure life. There are instances where variations in coating thickness have altered the type of failure experienced with the same coating material. Other cases have been observed where thickness variation has affected the permeability of the coating and the ease with which water vapor and gases diffuse through the coating to react with the base metal.

Many methods have been used for the measurements of dry film thickness. One method involves accurate micrometer measurements of a spot on a test panel before and after removal of the film, whereas another method is based on a needle penetration device with electrical indication of contact with the base surface. Work conducted at the National Bureau of Standards as early as 1938 resulted in the development of a magnetic method for measuring the thickness of non-magnetic coatings on steel. The method depends on a decrease in the attraction of a permanent magnet for steel when the two are separated by a non-magnetic coating. Another type of film thickness instrument is based on the influence on the reluctance of a magnetic circuit produced by interposition of a non-magnetic film between the measuring device and a magnetic

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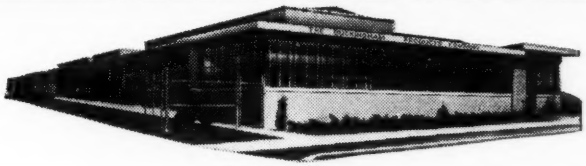

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base. (Am. Machinist, 86, 1942).

A practical method has been described for measuring the thickness of organic films applied to non-magnetic conducting metals without destroying the film at any point, regardless of the area involved. (Ind. Eng. Chem. Anal. Ed., June 1945).

The test instrument is based on the fact that when an alternating current

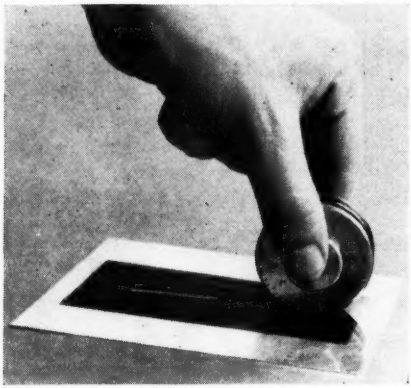


Fig. 1—Interchemical Wet Film Thickness Gage
(Photo courtesy Henry A. Gardner Laboratory, Inc., Bethesda 14, Md.)

flows in a coil near the surface of a non-magnetic metal, eddy currents are set up in the metal which will affect the inductance of the coil when placed upon or near the surface of the metal. It is reported that the instrument has been successfully used over various aluminum alloys, copper, brass and magnesium and should perform adequately over any conducting metal which is non-magnetic.

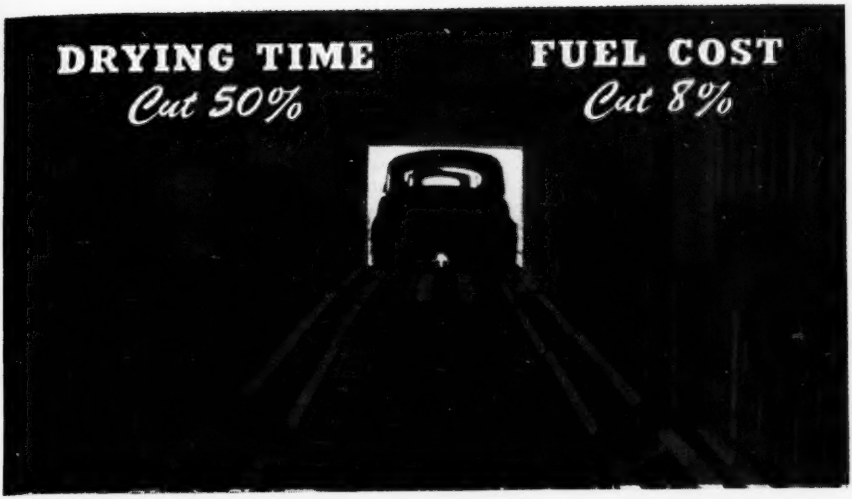
A new instrument for measurement of wet film thickness has recently been developed by the Interchemical Finishes Division. This instrument, photograph of which is shown in Fig. 1, is actually one integral piece of stainless steel, and can be described as consisting of two concentric wheels, supporting between them a slightly smaller eccentrically mounted wheel that clears a rigid surface upon which the gage is placed by a distance varying from zero to four mils. In use, the gage is held between thumb and forefinger and is rolled over the coated surface, starting at the point where the center-wheel clearance is greatest and ending after one-half revolution. At some point along its circumference, this center wheel makes contact with the coating. The film thickness is read off directly at this point from the calibration along the edge of the wheel. Two readings, made by rolling the wheel in opposite directions, are recommended for greater accuracy.

The main advantages of the new gage are simplicity and rapidity in taking measurements, direct reading of film thickness, and improved accuracy. There is little doubt that it will prove to be a useful tool for maintaining standards of application of coatings in the field and also as a means of control in laboratory evaluation of industrial finishes.

It is also important from the standpoint of securing uniform film coverage that the correct procedure and sequence of operations be worked out for the application of finishing materials to metal products. The applied finish should be inspected frequently as it leaves the spray booth and after baking, and any observed application defects corrected.

Also it is important to remember that the hangers or racks used for suspending or supporting the work for finishing should be so constructed that the parts or assemblies are firmly anchored and in a position to allow the operator easy access to surfaces to be coated. The hangers should not interfere with the spraying of important surfaces as such interferences slow up the application and tend to produce shadows in the finish.

Finally, in line with proper film



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thickness control, it is important that the film thickness of the applied and cured coating be checked as frequently as necessary to keep it in line with the established standard. Thin films will undoubtedly result in unsatisfactory appearance and durability, while films heavier than required result in excess finishing material cost.

* * *

Adequate Ventilation in the Plating Department

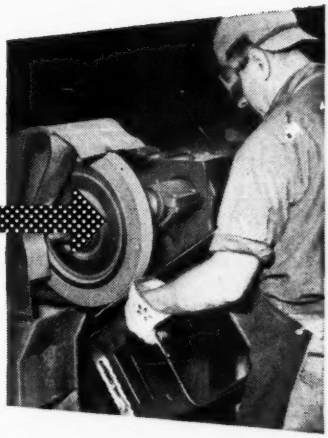
VENTILATION requirements must be regarded as a part of engineering planning for the modern plating department. Good ventilation in the plating department is being designed and laid out so that there will be adequate space available. The ventilation should be generously planned, and made to include exhaust of not only toxic fumes, but also steam from hot water rinse tanks, alkali electrocleaners and other relatively harmless processing equipment, which in the past was allowed to steam up the plating room.

It is important to remove all steam and water mist from liquid surfaces before they have an opportunity to get out into the factory and strike cold surfaces, where they can condense and drip, or increase the rate of corrosion of steel work or machinery. Likewise, the ventilating system should remove all corrosive or toxic fumes before they can come in contact with workmen within the exposed area. In general, it is desirable to consider the ventilation of each tank separately from the standpoint of available space and the way by which work enters and exits. The nature and degree of the nuisance and also the possible interference of the ductwork will often play a part in determining the type of system and its magnitude.

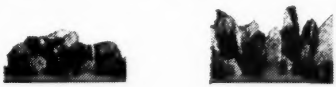
In considering the ventilation of the

The Backstand-Belt Method of Production Grinding, Polishing and Finishing offers

NOT 1 BUT 5 ADVANTAGES



For grinding, polishing and finishing hundreds of consumer and industrial items, the backstand-belt method is more efficient and economical than the older set-up wheel method—because the backstand-belt has these five advantages over the set-up wheel...



a b

1. An abrasive belt is a scientifically made tool, manufactured under controlled conditions by experts using modern making equipment. The photomicrographs compare the crude, uncontrollable rolled-on cutting surface of (a) a typical set-up wheel with (b) the coating on an Armour Abrasive Belt. The sharp cutting points on the factory coated belt are exposed to provide faster, cleaner cutting action, increased production.

2. Coated abrasive belts cut cooler because of a longer interval between work contacts.

3. Inexperienced help can be quickly trained to operate a backstand-belt machine. Highly skilled personnel needed to dress the wheels can be used elsewhere.

4. It takes only a few seconds to change a coated abrasive belt.

5. Temperature-controlled room for curing set-up wheels can be released for other uses.

Actually, there are more than five advantages to the backstand-belt method. For additional information send coupon at left for our new informative booklet—"Facts about Backstand-Belt Grinding and Polishing."

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plating room, as a part of a general discussion on engineering planning in the plating department, before the 1948 annual convention of the American Electroplaters Society, S. M. Martin, Chief Engineer, United Chromium, Inc., stated that even with the number and types of exhaust fans and ducts or systems decided upon, there still remain the following questions: (1) where is the required air coming from; (2) where can it be safely discharged; and (3) how does one exhaust system influence another?

Replacement air needed to take the place of the air drawn out by the exhaust fans can come from other parts of the plant, through open windows or ventilators or other openings in the building, or through replacement air ducts, with or without heaters. If replacement air is not readily available, the exhaust fans will take the air from the plating room only, and reduce the air pressure in the room. If this pressure is reduced substantially, and if the exhausts are not properly spaced, it will seriously hamper the work of all the exhaust fans and perhaps create an unbalance among the several fans. This means risk of dangerous fumes not being removed satisfactorily. Furthermore, under conditions where the plating room is under reduced pressure, dirt and dust from surrounding departments may be drawn in, and thus lead to unnecessary and harmful contamination of the plating baths. If replacement air is taken from outdoors in the colder sections of the country, heaters are required. Here, careful consideration is necessary in order to obtain the proper size and type of heater units, generally of the non-freeze type.

Another point brought out by Martin is that exhaust air should be commonly discharged above the roof or into an unused area in such a manner as to avoid any flow back through the win-

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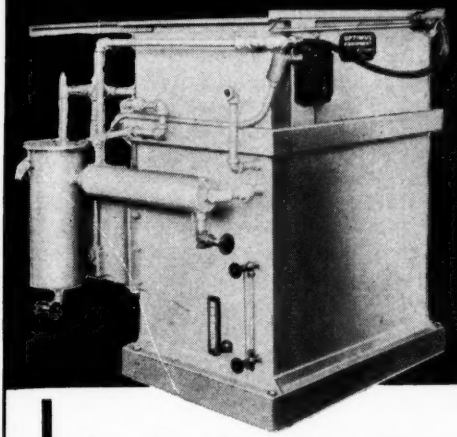

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dows, monitors or other intake openings. If the exhaust air is heavy with exhaust spray or fumes, such as the exhaust from a chromium plating tank, the fumes should be first cleaned by suitable means, which may be simple or elaborate depending on local conditions and circumstances.

Where fumes are corrosive, special attention should be given to protection of the ventilating system itself from corrosive action. Because fans and ducts of special metals are relatively expensive, in the design of the plating department the possibility should be considered of combining all non-corrosive ventilating air into one system and making the acid fume handling system entirely separate, to reduce the overall cost. The materials used and coatings for the ducts and fans require special consideration if a long life is expected.

* * *

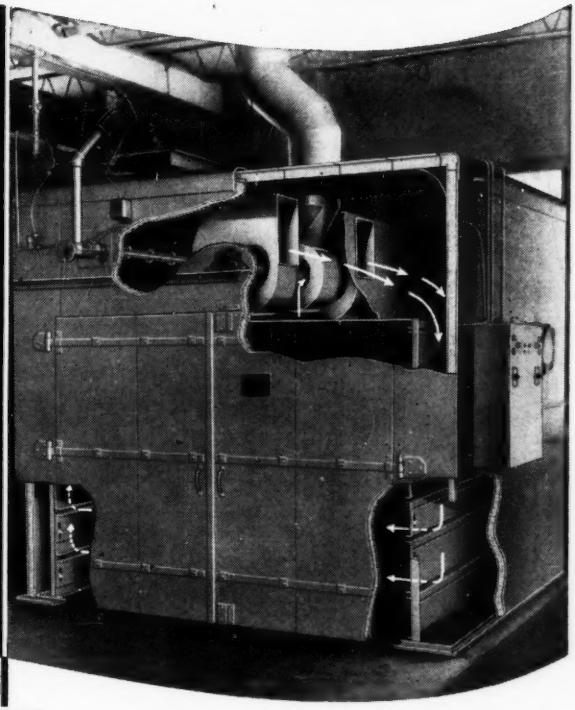
Organic Finishing of Magnesium

IN organic finishing systems for magnesium, the primer coat should be the first material applied. The careful selection of a primer, in consideration of the service it must perform, is a major step in initiating an effective organic finish system. Both mandatory and desirable qualities for a magnesium primer have been established. Thus, the mandatory qualities are those that affect adhesion and protection; the desirable qualities add to the above and in addition aid in manufacturing and processing.

Resistance to water, moisture permeability and penetration is one of the foremost factors in determining whether or not a given primer should be used for magnesium. Also, the fact should be kept in mind that moisture permeability implies greater danger than the actual softening and destruc-

The Well Designed Industrial Oven

does a better job at less cost



This batch type oven used equally well for core, insulation, paint and grinding wheel baking—also low temperature heat treating, plastic curing and other processes, is a compact, self-contained unit. Recirculating heaters and exhaust fans are integral parts of the oven assembly for maximum heat conservation, greatest economy of plant space and better appearance. Note they are entirely within the oven frame.

Although gas heating is illustrated here, any other type of heating is equally applicable.

A single drive motor operates both recirculating and exhaust fans for maximum power saving.

A positive movement of heated air across the work space assures uniform baking temperatures throughout the entire load and maximum baking efficiency.

Field installation is greatly facilitated by the use of a completely wired operating control panel. All operating and control parts are readily accessible for inspection, service or adjustment.

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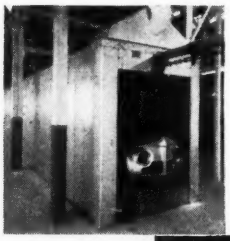
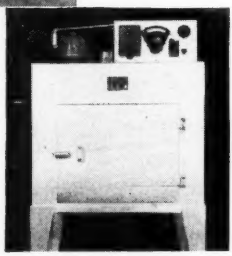


To the left is a large conveyor type oven for baking finish on auto bodies.



To the right is a small multi-purpose oven for a variety of finish baking needs.

Young & Bertke engineers are prepared to build you ovens of any size any capacity to best fit the individual needs of your plant layout and product. Years of experience in successfully solving all kinds of finishing problems are your best guarantee that a Young & Bertke Oven will give you low-cost, efficient service.

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tion of the prime coat; thus, unless the primer can effectively prevent moisture penetration, its purpose as a protective barrier between the base metal and exterior corrosive elements is of no consequence.

Although it is true that a primer for magnesium will seldom be called upon to adhere directly to the metal, it should exhibit the quality of adhering to the film formed by an appropriate chemical surface treatment. A primer coating that fails to adhere will soon lose its effectiveness, resulting in actual peeling of the film, or in blistering of the coating which will substantially shorten the life of the overall finish. One other requisite, which must be kept in mind in the primer selection, is that the coat must furnish a bonding surface for subsequent coats of paint. Since in this requirement, bonding is generally accomplished by mechanical interlocking, which takes place between the surfaces of both paint coats, it is generally desirable to avoid the use of a primer that develops a hard, smooth finish.

To meet requirements of a primer for magnesium articles, the basic pigments have proved most satisfactory; according to recommendations of the Dow Chemical Company, zinc chromate is generally considered to possess satisfactory all-round properties. The use of red oxide as a pigment for primer coatings has been satisfactory, but most finishing men think that its use requires a baking operation to bring out the optimum qualities. One good rule to follow is to avoid primers with an alkaline reaction; furthermore, pigments containing components which would be conducive to galvanic action, such as graphite, should be avoided. One other point to keep in mind is that the purity of the zinc yellow pigment used in primers for magnesium is important. Low chloride and low sulfate zinc yellows are desirable.

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Other ACP chemicals include: "Kemick" (a heat-resisting paint for use at temperatures above 600° F) — "Flosol" (soldering fluxes) — "Cuprodine" (copper coating chemicals for ferrous surfaces) — "Cuprotek" (for protection of cuprous surfaces against rust) — "Ridoline" and "Ridosol" (cleaning agents) — "Peroline" (chemical and oil for protecting parts in storage).

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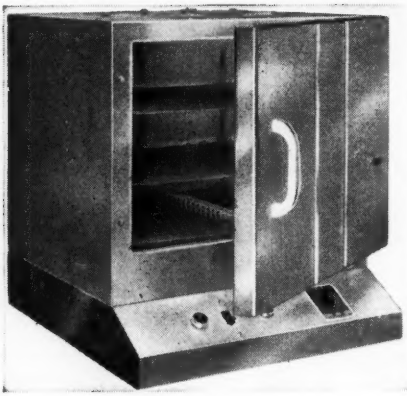

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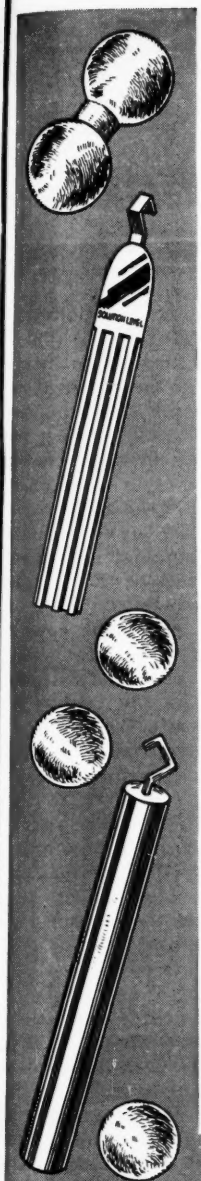
However, most pigment manufacturers have recognized this point and the proper materials are now generally available.

In the application of the primer coat, care should be taken to see that even distribution over the entire surface is brought about. This point requires particular consideration when the part being coated has sharp radii or angular protrusions. The finisher should keep in mind that the surface tension of the liquid primer may tend to draw the coating thin over such sharp areas, thus leaving unprimed areas on the base metal. It is generally thought advisable to apply the primer in a thin coat, averaging about one-half mil in thickness; and to ensure complete and uniform coverage, it is good practice to apply two coats, giving a total average thickness of about one mil.

There are a wide variety of finish coatings available. Most any type of paint properly applied over a good primer base coating will suffice for simple indoor decorative applications. Other applications may require some consideration of materials to be used. Sometimes the high coefficient of expansion of magnesium should be taken into consideration, since the more inelastic paints and enamels may crack and flake off if the finished article is subjected to extremes of temperature. Recent results on service data indicate that baked finishes are very effective for the protection of magnesium articles of various kinds.

"Cadalyte," a complete cadmium plating salt specifically designed to simplify the production of any type of cadmium plating over a wide range of operating conditions, is described in an eight-page manual available from E. I. du Pont de Nemours & Co., Electrochemicals Dept., Wilmington 98, Del. Complete data on the operation and maintenance of Cadalyte plating solutions are offered. Copy free upon request.



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PRACTICAL APPLICATIONS *of Modern Products*

Magnetic Measurement of Composite Copper-Nickel Coatings

A CONVENIENT, non-destructive magnetic method for determining the thickness of composite copper-nickel coatings electrodeposited on steel (J. Research NBS 40, 295, 1948; RP 1875) has been developed by Abner Brenner and Eugenia Kellogg of the National Bureau of Standards. The method involves the measurement of the attractive force between the plated specimen and two permanent magnets of different strengths. The values thus obtained are used, in conjunction with a set of previously determined calibration curves for each magnet, to obtain the total thickness of the coating and the relative thicknesses of the copper and nickel layers.

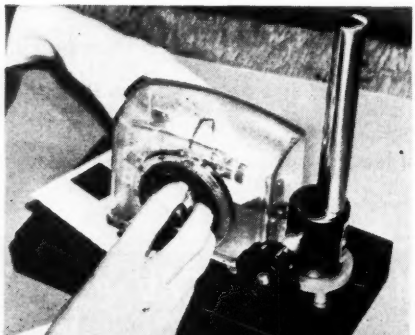


Fig. 1—View showing the Magne-gage being used for determining thickness of copper and nickel in composite plated coating (*Photo courtesy National Bureau of Standards, Washington, D. C.*)

Composite coatings, in which nickel is deposited over a layer of copper, are used extensively in the automotive and other industries for the economical protection of steel against corrosion. While the effectiveness of these coatings is usually somewhat inferior to that of pure nickel plate, the copper required is less expensive than the extra layer of nickel that would otherwise be necessary. As the protective value of the composite coatings depends largely on their thickness, it is important to have a convenient means for measuring this property. In the usual procedure, the plated article must be destroyed to provide a cross section for microscopic examination. The new magnetic method, on the other hand, eliminates the necessity of cutting the specimen and is easily and rapidly applied.

This method utilizes the principle of the Magne-gage, an instrument originally designed at the Bureau to measure the thickness of single electrodeposited coatings on the basis of the attraction between a small permanent magnet and the plated sample. The Magne-gage is essentially a spring balance, on the arm of which a magnet is suspended in contact with the coated surface. A helical spring is so attached

that, when wound by means of a knob, it exerts a force tending to detach the magnet from the surface. If, as is ordinarily the case, the coating is less magnetic than the object plated, the required force, as indicated on a dial adjacent to the knob, will be greater for thinner coatings.

For measurement of composite coatings, the Magne-gage is modified by the use of two magnets of different strengths. A set of calibration curves for each magnet—total thickness versus dial readings—are plotted on transparent material for coatings of successively varying known proportions of copper and nickel. After readings are taken with each magnet on the composite coating under study, one set of calibration curves is superimposed on the other in such a way that the values of the two separate dial readings on the horizontal scale for each magnet are brought into coincidence. A straight line is drawn joining points of intersection of curves of the same

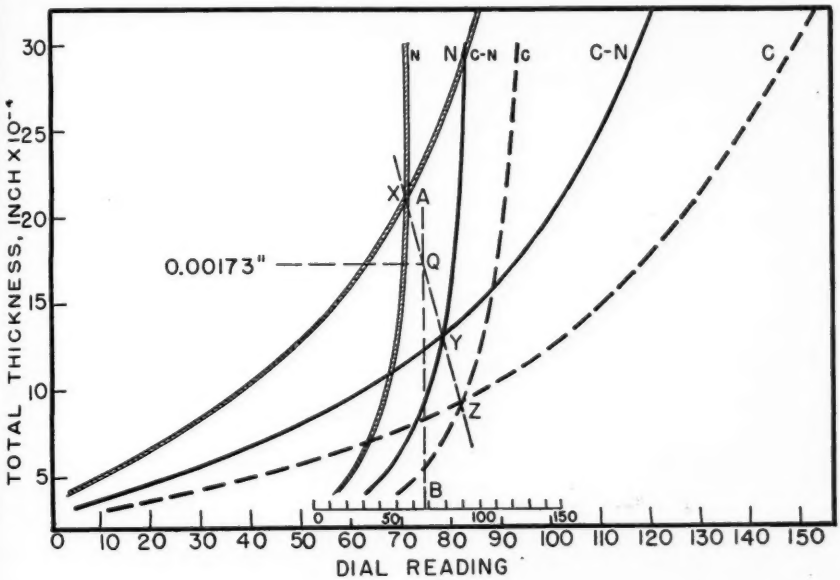


Fig. 2—Diagram illustrating a graphical method developed at the National Bureau of Standards for use with the Magne-gage in determining the thickness of composite copper-nickel coatings. After readings have been taken with each magnet on the composite coating under study, one set of calibration curves is superimposed on the other, as shown in the figure. This is done by sliding the horizontal scales of the two graphs along each other until the two separate dial readings for each magnet are brought into coincidence at B. (In each case the curves labeled N, C-N, and C are for compositions of 100 per cent nickel, 50 per cent nickel and 50 per cent copper, and 100 per cent copper, respectively. However, those for the weaker magnet have much greater slopes). A straight line (XYZ) is drawn joining points of intersection of curves of the same percentage composition for the two different magnets. If a second line AB is now drawn through B perpendicular to the horizontal scales, it will intersect the line XZ in a point Q. The ordinate of Q, reading from the vertical scale common to both graphs, is then the thickness of the total coating (here 0.00173 inch). The relative thicknesses of the copper and nickel layers are also obtained by graphical interpolation along the line joining the intersection points of curves of equal composition. In this case, for example, since Q lies along XZ about 40 per cent of the distance from the half-copper curve to the nickel curve, the copper content of the coating is (40/100) x 50 or 20 per cent.

(Illustration courtesy National Bureau of Standards, Washington, D. C.)

percentage composition. If a second line is then drawn perpendicular to the horizontal scales of the graphs through the point representing the dial readings, it will intersect the first line in a point corresponding to the thickness of the total coating. The relative thicknesses of the copper and nickel layers are also obtained by graphical interpolation along the line joining the intersection points of the curves of equal composition.

In this way, total thicknesses of composite coatings ranging from 0.0005 to 0.003 inch can be determined with an accuracy of about 10 per cent. The thickness of each component layer of similar coatings can be measured to an accuracy of about 15 per cent.

Conveyor Type Machine Simplifies Cleaning Operation

AT the Danahy Packing Co., Buffalo, N. Y., delivery provision boxes must be washed and sterilized inside and out without destroying paint applied to the outside of the boxes. To improve the hand cleaning method formerly used, increase the cleanliness obtainable, and secure a production of 700 units in 8 hours, a belt conveyor type wash and rinse machine, manufactured by the Cincinnati Cleaning & Finishing Machinery Co., Ironton, Ohio, was recently installed.

With the aid of this machine, containers are washed and sterilized automatically, the desired production is secured, and the cleanliness of the containers has been improved in uniformity, as well as quality. It is reported also that operating efficiency has been increased and that it is now possible to clean more containers with the same weight of cleaning compound than was previously possible. A view of the installation, showing the completely mechanized cleaning and sterilizing unit and auxiliary conveyors, is shown in the accompanying illustration.

Bright reflective anodizing (electrolytic), a combination of chemical polishing and anodizing to produce a bright reflective finish either clear or in color, has been developed for treating aluminum and aluminum alloy stampings, forgings, or castings.

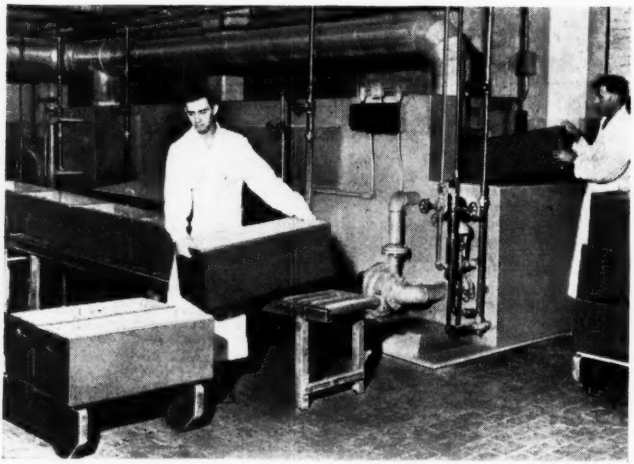
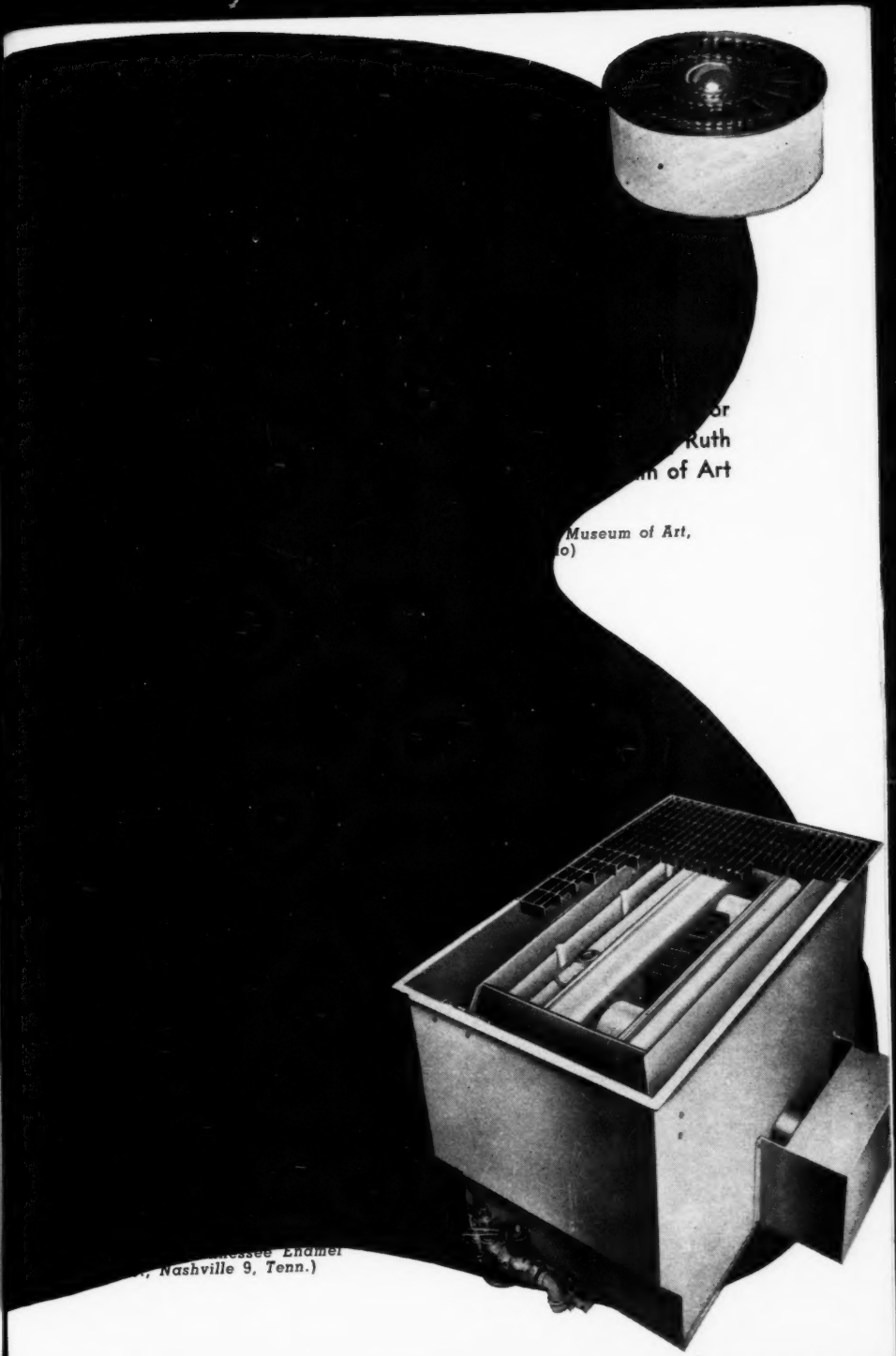


Illustration shows conveyorized automatic washing and rinsing machine recently installed at the Danahy Packing Company to mechanize a cleaning operation. *(Photo courtesy Cincinnati Cleaning & Finishing Machinery Co., Ironton, Ohio)*



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NEWS of the Industry

NEW PLANTS

O. J. S. deBrun, president of **THE EGYPTIAN LACQUER MANUFACTURING COMPANY,** 1270 Sixth Ave., New York 20, N. Y., announced that construction of the company's Lafayette division has begun.

The new plant will be in Lafayette, Indiana, on the Cincinnati to Chicago Highway (No. 52) about 120 miles south of Chicago and 60 miles from Indianapolis.

Products will include the complete line of synthetic and lacquer industrial finishes and thinning materials now manufactured in Egyptian's Eastern division.

For over 50 years the company's plant and laboratories have been situated in northern New Jersey, for the major part of the time at its present site in South Kearny. Shortly after the recent war it was decided that the requirements of Midwestern users of quality product finishes could be filled better from a point closer at hand. The large modern New Jersey plant will continue to serve the Atlantic seaboard states.

The new Lafayette division will have

New plant of Lafayette Division, The Egyptian Lacquer Manufacturing Company

product equipment of advanced design. The entire plant has been carefully planned so that the most modern methods of producing finishing products may be employed. Product development laboratories sufficiently extensive to provide for independent treatment of the Midwestern users' finishing problems will be provided. Completion of the structure is planned for early 1949.

THE PEMCO CORP., 5601 Eastern Ave., Baltimore 24, Md., completing the third phase post-war program for modernization and expansion of its laboratories, has announced that the new $50,000 research and development laboratory has been completed and is now in use by members of the staff conducting research and development work on the company's products; chiefly, porcelain enamel and glaze frits, glass enamels, porcelain enamel, pottery and glass colors, and ceramic chemicals.

The new laboratories are located at 2552 Greenmount Avenue, and are thus separate from office and plant locations to better enable the research staff to devote its entire time to research and development problems with the minimum of interference.

The new laboratory covers approximately 10,000 square feet of floor space and contains twelve completely equipped laboratories for various phases of ceramic research—a research library, staff offices, and conference rooms.

The porcelain enamel laboratory has been greatly expanded and at present consists of three separate and distinct laboratories, each one so designed that all types of porcelain enamels can be applied and fired under conditions simulating actual plant conditions. Laboratories have been provided for greatly expanded research and development work in the fields of glass enamels and inorganic colors for all types of ceramic ware. Improved facilities for batch mixing, smelting, and milling have been provided. A new and very completely equipped chemical laboratory and a complete physical properties laboratory, which includes not only facilities for physical, optical, and color measurements but also

Fig. 1—Shown here is the right section of the "twin section" chemistry laboratory for conducting research and development work on porcelain enamel, glaze enamel, glass enamel, porcelain enamel color, glaze color, glass color, and other ceramic chemicals. This chemical laboratory is one of the twelve completely equipped laboratories of the Pemco Corp., Baltimore 24, Maryland.

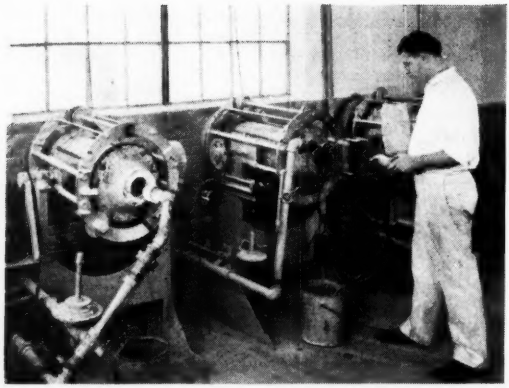


Fig. 2—A Pemco ceramic engineer feeds a porcelain enamel frit formula to one of the seven experimental rotary smelters used for experimental smelting at the new Pemco research and development laboratory. These smelters, with interchangeable liners which can be changed within 5 to 10 minutes, are constructed so as to provide the company's engineers with adequate experimental smelting facilities as well as to allow them to experiment with various types of fuel.

well equipped facilities for photographic and metallographic work, have been established.

Concurrently with the opening of the new research and development laboratories, it was announced that the customer service and quality control laboratories of the Pemco Corporation have been expanded and revised so that all operations are concentrated in a single area at the main plant. Considerable new equipment, including a laboratory size continuous enameling furnace, has been provided.

DETRO MANUFACTURING AND SALES CO., INC., Los Angeles, manufacturer of tack rags, sanders and polishers, and polishing bonnets and discs, has announced the completion of its new factory at 3429 Wesley St., Culver City, California.

The one-story building is constructed of cement block and contains approximately 15,000 square feet of available manufacturing space. Production is now in progress with the aid of new, modern machinery and equipment.

A new manufacturer of buffing compositions, organized to offer direct factory service to firms in eastern Ohio and western Pennsylvania, has begun operations. The new supplier is the **SCHAFFNER MANUFACTURING CO.**, Emsworth, Pittsburgh 2, Pennsylvania.

The company is under the direction of Paul E. Schaffner, formerly associated with the McAleer Mfg. Company of Detroit. The entire production staff has a background of many years' experience in the buffing field.

COMPANIES

NORTON CO., Worcester, Mass., has announced the retirement of two members of its machine division: Oscar E. Nordstrom, consultant for the Chicago territory, after 44 years' service, and Paul Hoffman, district manager of the New York office, after 35 years with the company. Mr. Hoffman is succeeded by B. Harold Lewis, formerly machine sales representative for the New England area.

CHEMSTEEL CONSTRUCTION COMPANY, INC., formerly located at Mertztown, Pennsylvania, has announced the establishment of a new office at 5428 Walnut St., Pittsburgh 6, Pa. Officers of the company, which specializes in the construction of acidproof tanks for pickling and allied operations, are Charles E. Stone, president; M. A. Stewart, vice president and treasurer; Sidney Fernekes, secretary; and C. B. Avery, vice president in charge of engineering.

To better serve the West Coast metal finishing industry, **HAMMOND MACHINERY BUILDERS, INC.**, Kalamazoo, Mich., has opened a new office at 1021 East 8th St., Los Angeles 21, Calif. E. C. Hammett has been appointed Western representative, and will offer his knowledge of metal finishing, grinding, and polishing to the finishing plants in the area.

what is your SIZE ?

The size which binds the coating to your product is just as important to the appearance of that product as the finish coat. The proper and safe size coat which metal should have in order that a successful coating system may be had enhances both the quality and the sales appeal of the finished article.

Watson-Standard has developed a complete line of sizes to provide a true and lasting bond between a coating and any type of material. These sizes are an integral part of all Watson-Standard finishing systems —systems which are formulated to fulfill your exact requirements

Write today for complete details.

TOUGH JOB HEADQUARTERS
Prescription Finishes
Give us your coating problem. We guarantee you an answer based on your conditions and not just a standardized formula

THE WATSON-STANDARD CO.
Manufacturers of
PAINTS • VARNISHES • INDUSTRIAL FINISHES AND LITHOGRAPH COATINGS

FACTORY AND GENERAL OFFICES PITTSBURGH, PA
WAREHOUSES BOSTON, BUFFALO, DETROIT NEW YORK

The creation of a new central manufacturing division has been announced by W. L. McKnight, president of the **MINNESOTA MINING & MANUFACTURING CO.**, St. Paul, Minn. General manager of the unit will be Dr. Byron J. Oakes.

This division, according to Mr. McKnight's announcement, will coordinate the operations of the National Synthetic Rubber Corporation, a 3M subsidiary in Louisville, Kentucky, and those of the special products division in St. Paul. Other units will be supervised by the central manufacturing division as the need arises.

How recent developments in the field of cleaning and allied procedures are helping industry to combat rising production costs was the central theme of a series of technical-sales conferences held recently in New York, Chicago, and Kansas City by **OAKITE PRODUCTS, INC.**, 22 Thames St., New York 6, New York.

The first of these regional conferences, held at the Hotel Pennsylvania, New York, incorporated a program of lectures and round-table discussions attended by field service representatives of the company's New England, New York, Philadelphia, Southern and Canadian sales divisions.

Similar conferences held at the Hotel Sheraton, Chicago, and the Hotel President, Kansas City, were attended by Oakite field service representatives from the Chicago, Detroit, and Central divisions, and the Pacific Coast, Midwestern, and Southwestern sales territories, respectively.

The Organic Coatings Division, **UNITED CHROMIUM, INC.**, 51 E. 42nd St., New York 17, N. Y., has announced the addition of a line of synthetic baking enamels to its line of Unichrome product finishes. A large group of formulations has been field tested for more than two years and by modification these formulations can be made suitable for almost any product, application technique, or baking cycle, it is stated.

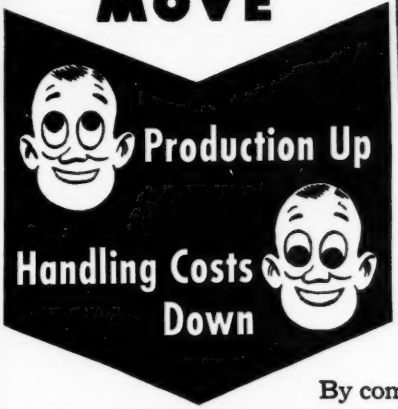
Included in the line are enamels based on urea-alkyds, vinyls, and highly specialized resins. The enamels are stocked in white, tinted whites, and black, and may be obtained in special colors on order.

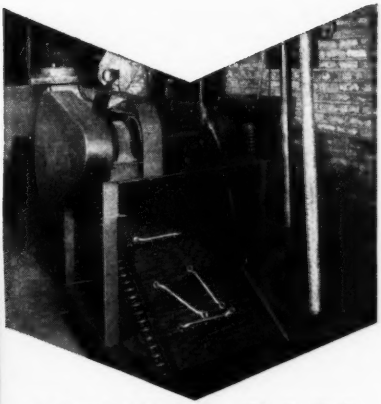
RIGIDIZED METALS CORPORATION is the new name which has been adopted by the former Rigid-Tex Corporation, 658 Ohio St., Pittsburgh, Pa. At a special meeting of the stockholders November 26, the name change was unanimously voted to better link the corporate name with the product, according to R. S. Smith, president.

Rigidized Metals Corporation produces design-strengthened and textured stainless steel, aluminum and other ferrous and non-ferrous sheet metals.

Oakite men in attendance at New York technical sales conference

Cambridge
WOVEN WIRE BELTS MOVE





A Cambridge Drive Chain Belt hustles wrenches through this quenching operation. Special metals are used in high temperature belts for brazing, annealing, sintering, soldering, etc.

By combining movement with processing, Cambridge Woven Wire Conveyor Belts offer these solutions to your materials handling problems.

Fast continuous production—improved, more uniform products—work area savings—reduced accidents from manual handling—PLUS reduced handling expense by freeing costly manual labor for other jobs.

Cambridge belts can be fabricated from any metal or alloy—to the mesh or weave that suits your requirements best.

FREE BOOK! "Woven Wire Conveyor Belts for Industrial Applications." 56 pages, illustrated. Describes Cambridge belt construction and use. Write today for your free copy . . . or call the Cambridge office nearest you.

Cambridge Wire Cloth Co.

Department A • Cambridge 1, Maryland

NEW YORK • BALTIMORE • PITTSBURGH • SAN FRANCISCO
BOSTON • DETROIT • CHICAGO • ST. LOUIS • HOUSTON

SPECIAL CHEMICALS CO., 30 Irving Pl., New York 3, N. Y., plating and chemical engineers, have announced that water soluble cutting and coloring compounds are now being marketed. These water soluble red rouges and tripoli are designed to include the latest innovations involving the scientific control of the grain size of abrasives used.

Walter B. Drake and Philip E. Glick, partners, Service Machinery Co., 2832 E. Grand Blvd., Detroit 11, Mich., have been appointed exclusive agents by **UNITED STEEL FABRICATORS, INC.**, Grand Rapids, Mich., to sell drying ovens, heaters, spray booths, infra-red gas systems, industrial washers, ventilating equipment, and other sheet metal products, in Detroit and other sections of Michigan.

NEW POSITIONS

Three changes in key administrative personnel in the Cellulose Products Department of Hercules Powder Co., Wilmington, Del., have been announced by J. J. B. Fulenwider, department general manager.

J. B. WIESEL, who has been director of sales since 1930, will become assistant to the general manager, **CARL W. EURENIUS** will succeed Mr. Wiesel as director of sales, and **A. R. OLSEN** has been named manager of plastics promotion. Mr. Wiesel will devote his time primarily to promotion of the department's products into new fields.

A. W. PINGEL has been named industry manager of the newly-formed Industrial Parts Division, according to an announcement by Lee Stratton, general sales manager, Parts Division, Reynolds Metals Co., 2500 S. Third St., Louisville, Ky. Mr. Pingel came to Reynolds from Revere Copper & Brass, Inc., Rome, N. Y., where he acted as assistant sales manager, aluminum and magnesium.

The function of the Industrial Parts Division, as defined by Mr. Pingel, is to carry aluminum a step beyond mill products. It will include shearing, stamping, drawing, forming, blanking, roll shaping, embossing, assembling, finishing, anodizing, and painting.

Announcement has been made by Oakite Products, Inc., New York, of the appointment of **FRANK L. OLDROYD** as sales manager of its Industrial Division.

Frank L. Oldroyd

Mr. Oldroyd has been associated with the Oakite organization in the servicing of its specialized industrial cleaning and allied materials for over 15 years, having spent 11 years as a field service representative. He will direct the activities of his staff from the company's general offices in New York.

Designers for Industry, Inc., 2915 Detroit Ave., Cleveland 13, Ohio, announces the appointment of **B. A. WOINA**, former chief engineer of Mullins Manufacturing Company, as director of its sheet metal products development and production engineering division.

Designers for Industry, Inc., with some 13 years' experience in product and development engineering, is expanding its sheet metal products division. Mr. Woina, the new director, has over 30 years' engineering and executive experience in the sheet metal field and has been responsible for several inventions and developments in the automotive and allied fields.

E. P. WALTERS has been promoted by the Chicago Vitreous Enamel Product Co., 1401 S. 55th Court, Cicero 50, Ill., to the position of district manager. His headquarters are now in St. Louis, Missouri, and he covers the Southwest.

E. L. SANDBERG has been named assistant general manager of the South Wind Division of Stewart-Warner Corp., Indianapolis, Ind., and **T. M. REDMOND** has been appointed plant manager. A recent announcement by J. S. Knowlson, president and board chairman of Stewart-Warner Corp., Chicago, Ill., named **A. R. COLLINS** as general manager of the Indianapolis division of the company.

Oldroyd

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MEMO TO MANAGEMENT

This is a preliminary report on our first three months of operation with the Ransburg Electrostatic Spray Painting Process:

Gallons of paint required	44% Less
Booth clean-up time	76% Less
Re-paints and rejects	88% Less
Man-hours per unit	90% Less

Even after writing off the change-over cost, these savings are probably the biggest in the plant, percentage-wise--maybe even the biggest dollar-wise.

● Not one plant, but plants in many varied industries report five-way savings like these with Electro-Spray . . . the process that pulls the paint on. Why not write today for engineering data on an installation to meet your particular requirements—or ask to see our full-color film? RANSBURG ELECTRO-COATING CORPORATION, Indianapolis 7, Indiana.

RANSBURG

THE KIRK & BLUM MFG. CO., Cincinnati, Ohio, manufacturer and designer of dust-collecting and fume-removal systems, announces the election of officers of the company occasioned by the death of the former president, R. J. Blum, on October 18, 1948. Officers and directors of the company elected at a meeting of stockholders on November 10 are shown seated, left to right, F. G. Weber, assistant secretary-treasurer; O. F. Tenoever, treasurer; W. R. Meuttman, vice president; R. J. Blum, Jr., president; C. F. Wulff, vice president; E. A. Vogel, secretary; F. A. Zink, director. The board of directors includes in addition to the above officers, Mrs. S. W. Kirk and Mrs. R. J. Blum.

Standing in the back row, left to right, R. W. New, Joseph A. Fries, R. B. Werner, C. S. Furman, Joseph Hetzer, C. S. Hulton, John Hetzer, S. L. Cox, M. G. Stock, E. A. Carsey, and E. W. Thiery.

The Kirk & Blum Mfg. Company was founded in 1907 by the late Sylvester W. Kirk and Richard J. Blum, as a sheet metal shop specializing in the design, fabrication and installation of dust-collecting systems for industrial plants.

The main offices of the company and several factory buildings are located at 2838-52 and 2833-61 Spring Grove Avenue with warehouse facilities at 4500 West Mitchell Avenue. Branch offices and subsidiary plant, The Liberty Engineering & Mfg. Company, are established in Louisville and Indianapolis, as are sales offices in other cities.

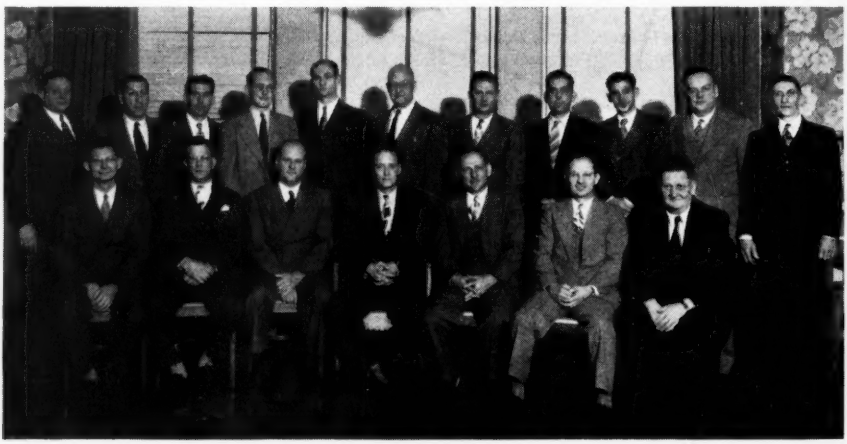
Appointment of **OLIVER McCLINTOCK** as assistant industrial manager of The Glidden Company was announced recently by A. D. Duncan, vice president.

Oliver McClintock

For the past 14 years, Mr. McClintock has served the M. B. Suydam Division of the Pittsburgh Plate Glass Company, gaining wide experience in all phases of industrial paint sales and service.

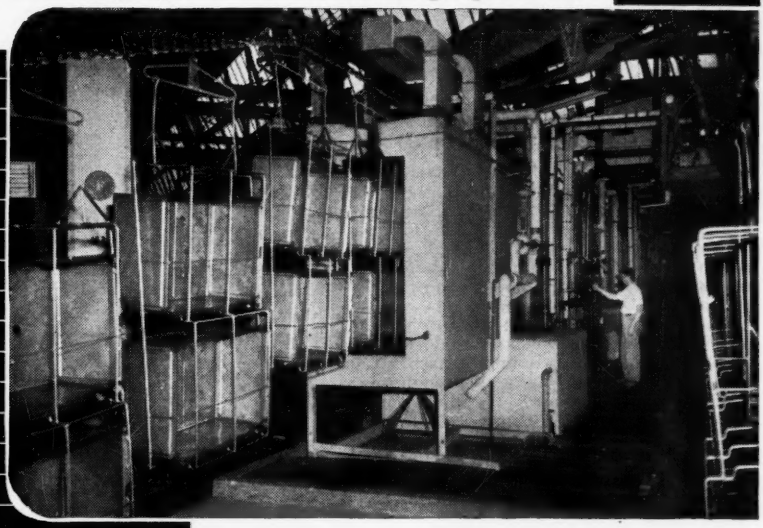
A graduate of Yale University, he began his career as a chemical engineer with the Gulf Oil Corporation. In his new capacity with Glidden, he will work directly under Mr. Duncan.

SELDEN T. WILLIAMS, vice president of Scovill Manufacturing Company, Incorporated, has been appointed general manager of A. Schrader's Son Division. He joined A. Schrader's Son in 1929 and in 1944 was appointed vice president of Scovill, in charge of manufacturing of Schrader domestic and foreign plants.



Officers and directors of the Kirk & Blum Mfg. Company

NO REJECTS DUE TO CLEANING
in this large porcelain enameling operation



In this modern Eastern plant, producing refrigerators and home freezers, the porcelain enameling layout was especially designed to incorporate the latest equipment, including a 12-stage overhead conveyor-type spray washing machine.

Pennsalt Cleaners are used exclusively in this streamlined operation . . . in which parts can be on the way to assembly 1 hour and 45 minutes after they enter the washing machine. That calls for *efficient cleaning* . . . and efficient cleaning they get. In approximately a year, there have been *no rejects traceable to faulty cleaning.*

PENNSALT CLEANERS clean deep drawn cold-rolled steel refrigerator liners prior to porcelain enameling

There are Pennsalt Cleaners for practically every type of metal cleaning. These products are concentrated, highly active, free-rinsing and long lasting. Pennsalt's technically trained representative will gladly study your set-up to see how Pennsalt Cleaners may give you better work at lower cost. Write to Special Chemicals Division, Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa.

PENN SALT
METAL CLEANERS

According to an announcement by P. W. Meyeringh, vice president, **DR. RICHARD E. CHADDOCK** has been named manager of Hercules Powder Company's sales research division. He succeeds Carl W. Eurenius, who has been named director of sales of the company's Cellulose Products department.

Dr. Chaddock is a graduate of the University of Michigan and is a member of the American Chemical Society and the American Institute of Chemical Engineers.

The appointments of **DR. ALBERT E. SIDWELL, JR.**, as assistant director of research and **RALPH F. WOLF** as mananger of compounding research for the Columbia Chemical Division of the Pittsburgh Plate Glass Company have been announced by Dr. Alphonse Pechukas, research director for the division.

Dr. Sidwell will direct the division's laboratory work in inorganic and analytical fields. He was previously associated with the American Medical Association.

Mr. Wolf was formerly technical director of the Standard Chemical Company.

it's Cheaper to
POLISH • LAP • BURR
SMALL PARTS
with . . .
SCHAUER
speed lathes
Users report savings of from 30% to 90% in secondary finishing costs when Schauer Speed Lathes are used. Learn how you can use these low-cost, high-production machines. Save with Schauer.
Write for Catalog 480
THE SCHAUER MACHINE CO.
• Originators of Today's Speed Lathes
2065 Reading Rd., Cincinnati 2, Ohio, U.S.A.

G. B. WORK has been named assistant general manager of the Industrial Finishes Department of Atlas Powder Co., Wilmington 99, Del., according to an announcement by E. H. Bucy, general manager.

G. B. Work

Mr. Work was formerly associated with The Glidden Company as industrial sales manager of the Finishes Division at Reading, Pennsylvania. He will make his headquarters at Stamford, Connecticut, but will work with both branches of the Industrial Finishes Department located at North Chicago and Stamford in the interest of Zapon finishes.

DR. T. H. McCONICA, III, has announced his resignation as technical assistant to the general manager of the magnesium division of The Dow Chemical Company to devote his full time to the managership of The American Ski Co., Clare, Mich., manufacturer of magnesium skiing equipment.

Dr. McConica, well-known throughout the industry as an authority on magnesium, has been associated with Dow for the past 10 years and has been active in many phases of magnesium development.

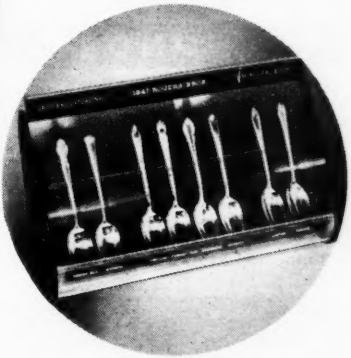
Elliott S. Phillips, president of Devoe & Raynolds Company, Inc., 44th St. and First Ave., New York 17, N. Y., has announced that **ANDREW W. BORNHAUSER** and **CLARENCE W. SLOCUM** have been elected vice presidents of the company.

Mr. Bornhauser, who has been associated with the company over 29 years, was elected vice president in charge of the Jones-Dabney Division of Devoe & Raynolds in Louisville.

Mr. Slocum was elected vice president in charge of the Eastern Industrial, Railroad and Marine Division of Devoe & Raynolds located in Newark, New Jersey. He has been associated with the company since 1913.

Display for 1847 Rogers Bros. Division of International Silver Co., Meriden, Conn. Tray flocked by Blanca Products, Woodside, L. I. Plastic case by Steiner Mfg. Co., L. I. City, N. Y.

Fully Assembled Silverware Display
"Its Ounces of Flock Give it Pounds of Allure"



Surfaced with Sprayed-on *Flock*

Plain Wood Panels Acquire the Velvet Touch that Subtly Assists Quality-ware Selling

Here, for example, a strip of plywood 7" x 15" is inexpensively surmounted on the front with two paralleling wood strips, notched at intervals for silverware samples and fitted on the back with literature pockets. Prepared at least cost, it is then transformed by Flock surfacing (for little extra) into a display stage that has the appearance of having been completely covered with a richly colored velvet!

When assembled with plastic components, the unit serves to impressively display and identify a selected group of eight silverware patterns. With Claremont Flock, much is possible—for little. An ounce of Flock is worth a pound of allure. It excels in the art of make-believe . . . fires the imagination—and justifies its application. Get the story about Flock—today . . . also names of processors ready to serve you.

CLAREMONT WASTE MFG. CO.
CLAREMONT, NEW HAMPSHIRE

G. Klinkenstein, president of the Maas & Waldstein Company, manufacturer of lacquers, enamels, and synthetics, has announced the transfer of **WILLIAM VARGO** from the company's main plant in Newark, New Jersey, to its Los Angeles division, the Smith-Davis Company, where he will be in charge of the factory.

Mr. Klinkenstein also announced the appointment of **FRANCIS K. WILSON** as sales manager to assist customers in the San Francisco area in solving production problems.

The appointment of **MARCUS A. MARKLEY** as manager of Sun Oil Company's Industrial Products Department has been announced by Samuel B. Eckert, vice president in charge of manufacturing. Mr. Markley succeeds **RAY H. ANDERS**, who has been assigned to do special work in the Administrative Department.

HONORS

Forty business associates and friends met at the Detroit Golf Club on December 2, 1948, in honor of the 50th birthday of **L. K. LINDAHL**, president of The Udylite Corporation.

Mr. Lindahl was presented a beautiful ship's clock and barometer by the group. One of the other gifts was a photograph album, bound in leather, which contained personal pictures and reproductions of press notices outlining his business and personal career from birth. The collection was secured by Robert C. Trees, advertising manager of Udylite, from Mr. Lindahl's family and business associates throughout the country.

MEETINGS

At a special meeting to be held February 9 at the McNiven Hotel, Frankenmuth, Michigan, a permanent charter will be presented to the **SAGINAW VALLEY BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY.** Following a dinner at 7 p. m., after which the charter will be presented, a board of experts will answer questions, and conduct a discussion on copper, nickel, and chromium plating, processing of die castings, and plating equipment.

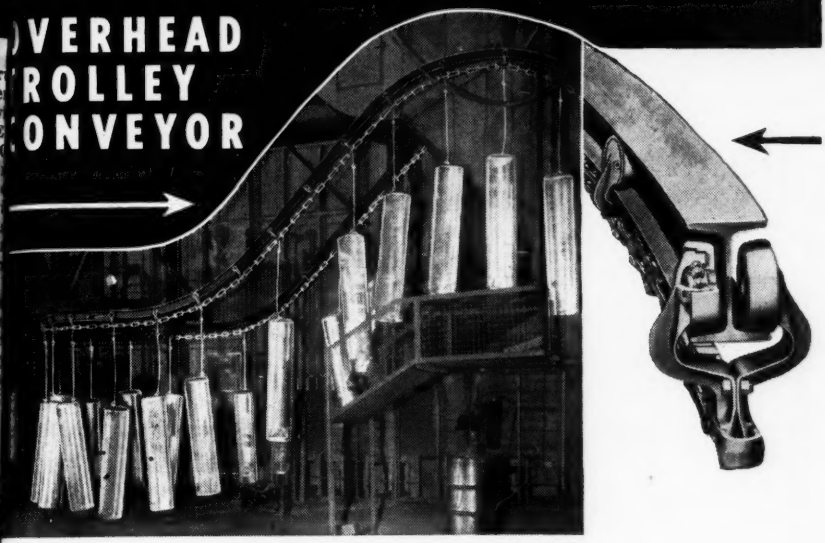
Serving on the board of experts will be Dr. M. M. Beckwith, The Harshaw Chemical Company; Dr. R. B. Saltonstall, The Udylite Corporation; Lyman Sperry, Doehler-Jarvis Corporation; and Earl Stadel, George L. Nankervis Company.

The eleventh annual educational session and dinner dance, sponsored by the **GRAND RAPIDS BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY**, will be held Saturday, January 29, in the Pantlind Hotel, Grand Rapids, Michigan.

The educational session, beginning at 2 p. m., will be conducted by S. S.

(Left to Right) R. L. Spitzley, president of the R. L. Spitzley Heating Company; W. M. Cornelius, chairman of the board of Parker Rust Proof Company; C. H. Reeme, vice president and treasurer of The Udylite Corporation; Mr. Lindahl; L. B. Nagle, vice president of Udylite, congratulating Mr. Lindahl; and E. R. Grace, vice president of Grant Advertising, Inc.

FUMES · · HEAT · · DUST · · DON'T BOTHER LINK-BELT



ater heater tanks carried through galvanizing process by Link-Belt erhead Trolley Conveyors in plant of important manufacturer.

Severe service conditions are being met constantly by Link-Belt Overhead Trolley Conveyors, in galvanizing, plating and painting departments, as well as in locations where heat, dust, fumes and vapors are present. In addition to relieving workers of many unpleasant tasks, Link-Belt Overhead Trolley Conveyors provide correct timing for drying, aging, storing and similar processes. They keep parts in transit off the floor, save valuable working space, "make ceilings pay dividends". Engineered and built by long-time specialists in materials-handling machinery, they possess numerous features assuring long life, smooth operation, low over-all costs.

LINK-BELT COMPANY 11,198

Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices in Principal Cities.

you'll never know
how much
you can save
by using
"LIQUID ENVELOPE"
PEELABLE
SPRAY-BOOTH
COATING
until you
take advantage
of this
test sample
offer

5 gallons shipped prepaid on a money-back guarantee $17.50.
Attractive low price on quantity re-orders.

BETTER FINISHES
AND COATINGS, INC.
264 DOREMUS AVE., NEWARK 5, N. J.
127 E. 7th ST., LOS ANGELES 14, CAL.
IN CANADA: HUGH RUSSEL & SONS, LTD.
MONTREAL AND TORONTO

Johnston, supreme president, A.E.S., an will consist of talks presented by the fo lowing speakers: Myron B. Diggin, tech nical director, Hanson-Van Winkle-Mun ning Company, speaking on "Levelin of Electrodeposits"; Dr. A. K. Graham executive Secretary, A.E.S., speaking o "What Constitutes a Satisfactory Elec trodeposit"; and Dr. M. M. Beckwith, Th Harshaw Chemical Company, whose sub ject has not been announced.

Dinner will be served at 7 p. m. an entertainment and dancing will follow.

SOCIETIES

Dissolution of the Formed Meta Plumbing Ware Association was com pleted simultaneously with the mas transfer of the association's former mem bers to a special division of the **PORCE LAIN ENAMEL INSTITUTE.** The ne PEI division, consisting of represent tives of practically the entire steel plumb ing ware industry, was incorporated du ing a recent meeting as the Steel Plumb ing Fixture Division of the Porcela Enamel Institute.

TRAINING COURSES

Maintained as a service to users of D Vilbiss equipment, several extensive on week courses for industrial finishers a again included in the curriculum of th School of Spray Painting by **THE DE VILBISS COMPANY,** 300 Phillips Ave Toledo, Ohio. These tuition-free course on function, care, and operation of spra equipment combine classroom instructio and demonstration with actual use of th equipment.

Identical courses, lasting one wee each, will begin on January 10, Februar 21, March 7, May 2 and June 20. Clas size is limited, and those intereste should write for reservations.

NECROLOGY

HUBERT M. ROSENCRANS, 59, a sistant director of sales of the Grassel Chemicals Department of the Du Po Company, died Thanksgiving night at th University of Pennsylvania Hospital Philadelphia after suffering a stroke the Penn-Cornell game at Franklin Fiel

• FOR HIGH PRODUCTION POLISHING AND BUFFING •

ROTARY AUTOMATICS • SEMI-AUTOMATICS • STRAIGHT LINE AUTOMATICS

ACME *STRAIGHTLINE* AUTOMATICS

• Cut POLISHING and BUFFING COSTS!
ACME— Horizontal Return Type, 20 to 120 ft. long.
ACME— 32 ft. Six Head Unit— loading table at one end — unload at opposite end—loose fixtures return by gravity roller or power belt as shown.

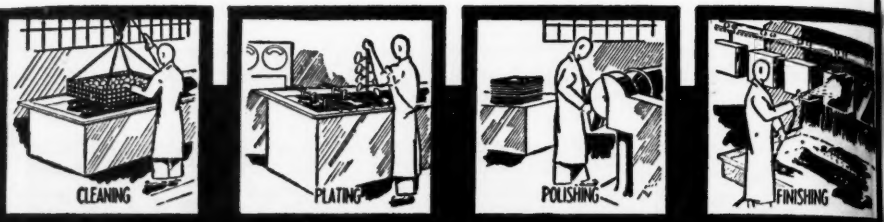
ACME Automatic Straightlines have proved effective in securing increased production at lower unit costs in a great many plants. They step up output per man-hour and maintain uniform standards of finish. Arrangements of tables, wheels and fixtures are planned to meet the requirements of the specific job.

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

ACME *Manufacturing Co.*

1645 HOWARD ST. DETROIT 16, MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS



New • EQUIPMENT • MATERIALS • PROCESSES

Excelsior New Wonder No. 27-K Sheet Grinding and Polishing Machine

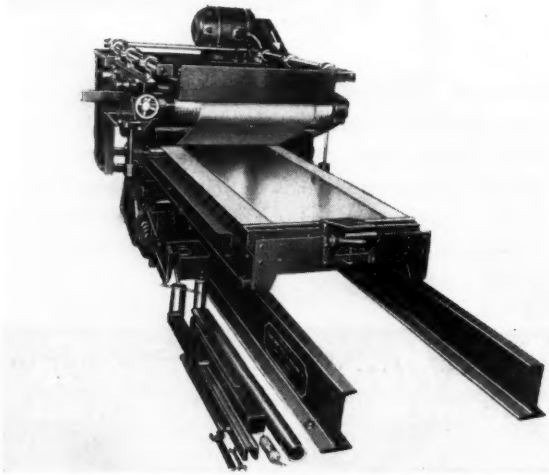
The New Wonder Sheet Grinding and Polishing Machine, designated as the No. 27-K, has been announced by the Excelsior Tool & Machine Co., 3100 Ridge Ave., East St. Louis, Ill. Claimed to have the advantages of easy location on any floor, rapid replacement of grinding belts, and simple mechanical operation, the machine may be used to polish any length sheet up to 144 inches.

The manufacturer states that all mechanically controlled adjustments are operated from the same location; the newly designed sheet clamping fixture is positive in its action; the carriage is designed to prevent overtravel, thus preventing damage to grinding belts or rubber contact roller on which any pressure from 200 to 600 pounds may be applied by removable hand weights. The latter feature is said to ensure a positive regulated pressure over the entire sheet.

The carriage is designed to travel 58 lineal feet per minute and is operated by a reversible motor so that it stops automatically at the end of each stroke and the rubber pressure roller releases so that the polished sheet can be removed.

The motor is connected with V-belts to the driving pulley on the polishing head. The front drum is adjustable to compensate for variation in grinding belt length and also may be adjusted to keep the grinding belts located properly on the drums. The grinding belt speed is 3,500 s.f.m. The drums are diametrically balanced and revolve in oversized dustproof ball bearings mounted in rigid cast steel frames.

Power requirements for operating the machine are 30 h.p. to operate the grinding belt and 2 h.p. to operate the reversible carriage.



Excelsior New Wonder No. 27-K Sheet Grinding and Polishing Machine

TAKE A TIP and get better acquainted with *Vedoc* finishes, an outstanding line of *organic* industrial coatings. All *Vedoc* finishes are developed for a specific use, then slightly varied to best fit each customer's production setup. Let us tell you more about them!

LIQUID PLASTICS DIVISION

FERRO ENAMEL CORPORATION

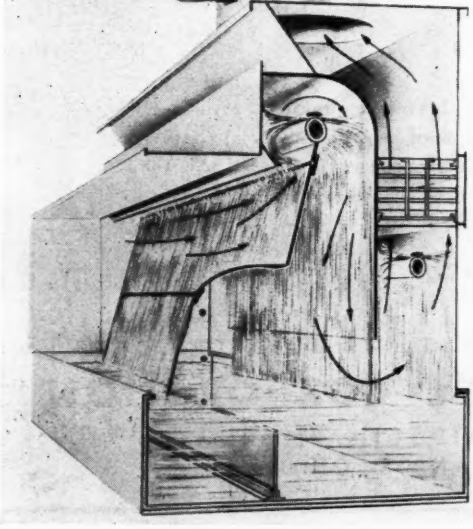
4150 East 56th Street

CLEVELAND 5, OHIO

New Binks Dynaprecipitor Water Wash Spray Booth

Said to virtually eliminate the hazards of fire or explosion, a new Dynapreciptor Water Wash Spray Booth has been developed by the Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 12, Ill. In the booth, overspray and fumes are whisked off through a solid, unbroken curtain of water and treated to five successively thorough scrubbings, which remove and collect paint solids and pigment for disposal or reclamation. No paint particles ever reach the exhaust stack to deposit on fan blades and throw them out of balance or form unsightly accumulations on surrounding property, it is claimed.

There are no nozzles or dead ends to clog or accumulate deposits. Therefore, there is always a continuous unbroken water curtain of high gallonage per lineal foot. Because the water is constantly recirculated by centrifugal pumps of ample capacity, only enough water is added from time to time to make up for small evaporation losses. Exhaust air, free from paint, passes through moisture eliminator plates before it reaches the exhaust stack, thus removing practically all moisture from the washed air.



New Binks Dynaprecipitor Water Wash Spray Booth

Rust-O-Primer

To eliminate the necessity of having to remove all rust or to have the surface perfectly dry before painting, a combination chemical pretreatment and primer for metal has been developed by The Wilbur & Williams Co., Greenleaf and Leon Sts., Boston 15, Mass. Known as Rust-O-Primer, the product is a vinyl base, quick drying wet primer applicable over wet or dry, clean or rusted metal including steel, aluminum, or galvanized iron. Its purpose is to provide a hard, paintable foundation for any type of paint.

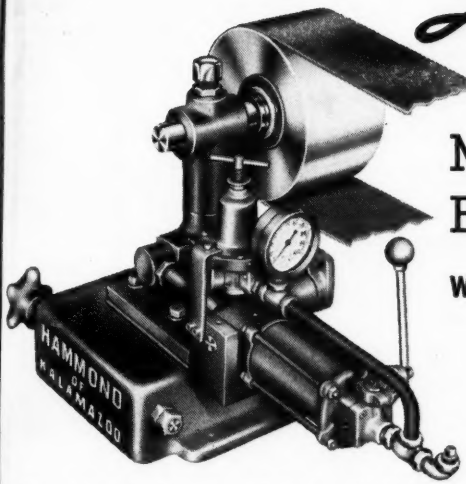
Chemical Brightening of Small Parts

A process by which small aluminum parts can be brightened by treatment in a special chemical brightening solution has been announced by the Technical Processes Division, Colonial Alloys Co., Philadelphia 29, Pennsylvania.

The brightening is accomplished by dipping the clean aluminum or aluminum alloy parts, in baskets, into the hot chemical polishing solution for from to 60 seconds after which the parts are thoroughly rinsed and dried. For further protection of the brightened surfaces, an additional treatment may follow the brightening dip. The second treatment is designed to coat the aluminum surfaces with a protective clear coating which is said to increase the corrosion resistance of the part. The second coating is also a good base for paints and lacquers and renders the aluminum smudge-proof for handling or storing, it is claimed.

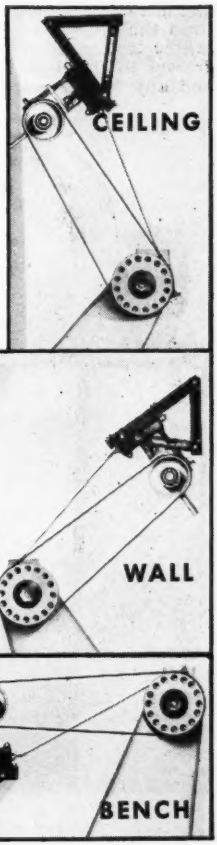
Small parts, such as stampings, pressings, drawings, extrusions, screw machine products, generally lend themselves well to this method of chemical brightening. Castings in general are not satisfactorily processed except in those cases in which a mild surface brightening is desired. Castings containing silicon are not recommended for this brightening treatment.

Hammond of KALAMAZOO



Model 6-A AIR Bench Backstand

WITH AIR BELT TENSIONING

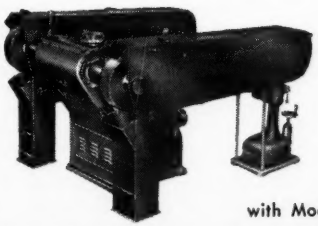


The Model 6-A Air Backstand SAVES ABRASIVE BELTS — INCREASES PRODUCTION — CONSERVES FLOOR SPACE.

An abrasive belt stretches as used. If correct tension is constantly maintained the belt will last longer and maximum production obtained.

The Model 6-A Air Cylinder tensioning backstand maintains the correct tension throughout the abrasive belt life and automatically adjusts belt stretch to a fraction of an inch.

Write for catalog showing the Model 6-A and our complete line of 9 bench and floor-type backstands.



Another popular installation—Model VRO Variable speed (1500-3000 RPM) polishing lathe with Model 3-R Backstand.

Hammond Machinery Builders INC

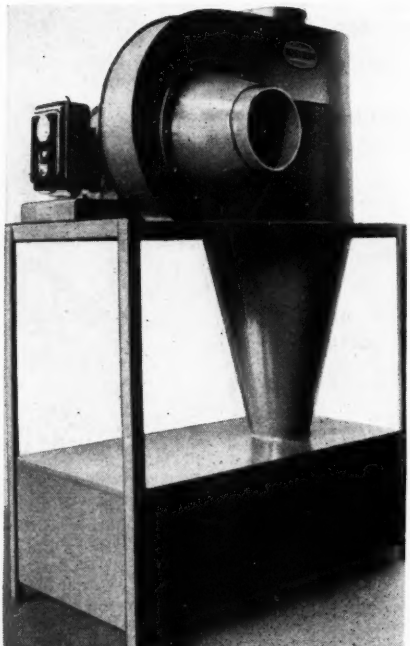
1622 DOUGLAS AVE. • KALAMAZOO, MICHIGAN

Dustkop Model 20N30

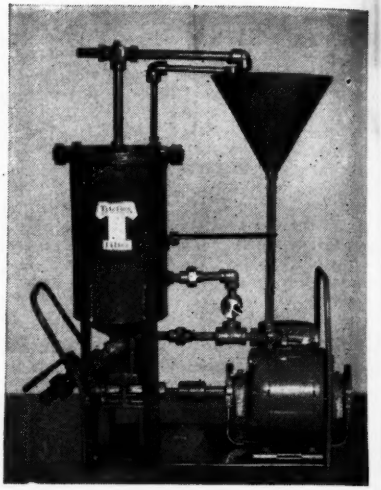
Dustkop Model 20N30 is the designation of a new self-contained, portable 2,300 c.f.m. dust collector designed for handling dusts and dirt or toxic fumes separately or in combination.

In contrast with other Dustkops in the line of the Aget-Detroit Co., Dept. 314, Ann Arbor, Mich., which feature recirculation of the cleaned air within the working space, the Model 20N30 exhausts the cleaned air outside the shop building. The chief purpose of the unit is to remove the dust and dirt from the air stream, yet permit the complete transfer of fumes outside the building.

The unit consists of a self-clearing paddle-wheel fan direct driven by a 3 h.p. continuous duty motor which is equipped with a motor starter switch. Dust and dirt drawn in from the source is removed from the air stream by the cyclone separator and deposited in the removable drawer in the dust bin. The cleaned air and any fumes not removed by the cyclone pass out through the outlet at the top of the cyclone where an 8-inch flange permits a slip fit connection with standard sheet metal pipe. Installation of the unit is usually made directly behind or near the source of the dust with the starter circuit of the dust collector being interconnected with that of the motor of the equipment creating the dust; this assures operation of the dust collector at all times when dust is being created.



Dustkop Model 20N30



Titeflex Model L50E Portable Filter

Titeflex Model L50E Portable Filter

A small, compact, portable filter has been developed by Titeflex, Inc., 422 Frelinghuysen Ave., Newark 5, N. J., for the filtration of chemical solutions. Known as Model L50E, the unit is 17 inches long x 8 inches wide x 26 inches high and weighs approximately 70 lb. Available in stainless steel, brass, iron, and Saran, with rubber lined tanks, it can be used on any chemical solution, it is claimed.

Equipped with a small positive displacement pump rated at 275 gallons per hour and powered by a ½ h.p. motor, the Model L50E Portable Filter can easily be carried from tank to tank for batch work. It can filter continuously on a specific tank, does not have to be taken apart for cleaning, and requires no parts, such as bags, sheets, or pads.

NO NEED TO BE A GUINEA PIG . . . .

Use Tried and Proved

Versatile

PHOSTEEL

The Chemical Treatment

That

Anchors Paint on Metal

PHOSTEEL produces a microcrystalline phosphate coating on metal --- providing improved corrosion protection. Steel treated with PHOSTEEL can stand around before painting without rusting . . . One coat of paint covers . . . Use hot in plain iron washing machine or still tank . . . Practical for almost any plant lay-out . . . An expert serviceman will consult with you at your request.

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3778 BELLEVUE AVENUE **DETROIT 7, MICH.**

Representatives In Principal Mid-Western Cities

In Canada made and sold by Boyle Chemicals Ltd., Windsor, Ont.

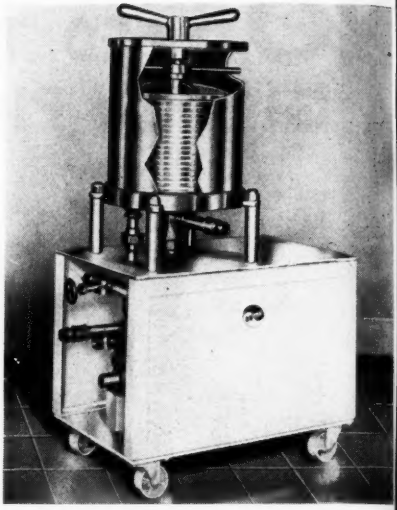
"Super" Aluminum Baking Enamel

The Industrial Division, Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N.Y., announces its product "Super" Aluminum Baking Enamel which can be sprayed or baked and which is claimed to ensure lasting, non-smudging protection.

The manufacturer states that the finish will withstand moisture, heat, acids, and alkalis, and recommends it for application by dipping or spraying to bed springs, filing cabinet drawers, electrical fixtures, and all metal surfaces which are subjected to metal-to-metal abrasion.

Ertel Model ECD Cylinder Type Disk Filter

The Ertel Engineering Corp., Kingston, N. Y., announces the development of a new positive seal cylinder type disk filter to be known as Model ECD which incorporates a new principle of double closure. The filtering elements are independently tightened from the cylinder. This method provides for the use of various types of rigid filter media in any number up to the rated capacity of the filter. After the filtering elements are sealed, the outer cylinder is independently closed by a separate handwheel.



Ertel Model ECD Cylinder Type Disk Filter

The filter is designed to make reloading and cleaning as simple as possible. By removing the head and the cylinder the entire unit is exposed. Standard inlet rings can be substituted for wider inlet rings (sludge rings) when it is necessary to absorb considerable amounts of solids.

The Ertel Model ECD Cylinder Type Filter is recommended for plating solutions such as copper, nickel, chromium, tin, and so on, and for food chemicals, extracts, and other products.

International Spray Booth Coating

A spray booth protective coating designed to facilitate the removal of overspray lacquer, paint, oil enamels, asphaltums, and similar products from spray booth walls has been announced by the International Products Corp., New York & Ferrier Aves., Trenton 1, N. J. The spray booth coating is furnished as a creamy liquid which can be sprayed on

CUT COSTS FOR 1949

USE HARRISON'S

4A

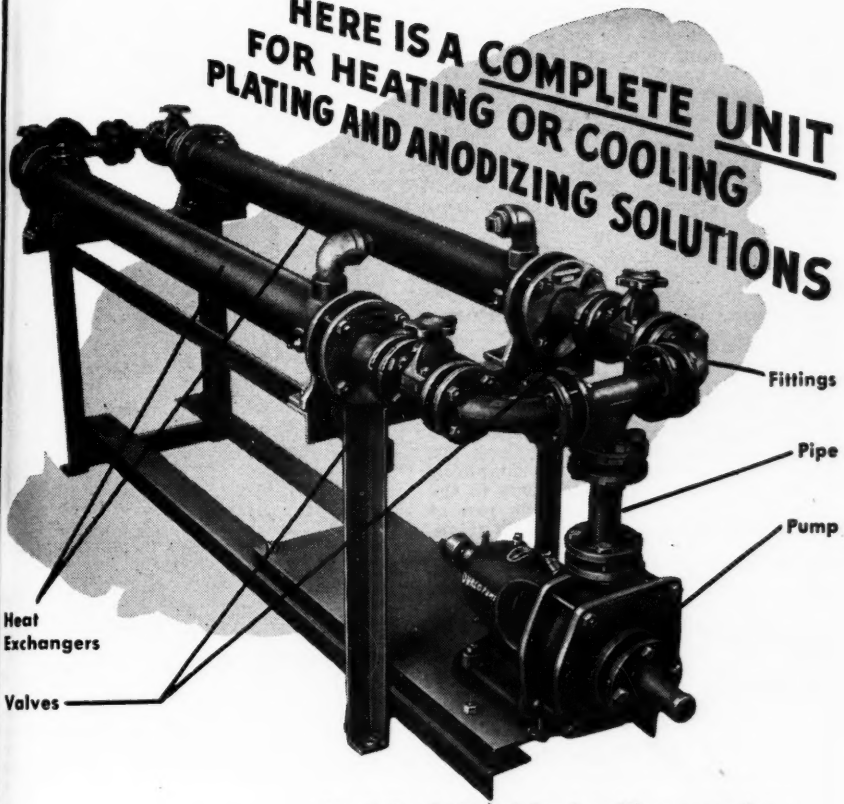
COMPOUNDS

YOU FURNISH THE PROBLEM...
WE WILL FURNISH THE ANSWER

Manufacturers of complete line of Polishing and Buffing Compounds in Spray, Dip, and Cake form.

HARRISON & COMPANY, INC.
HAVERHILL, MASSACHUSETTS

HERE IS A COMPLETE UNIT FOR HEATING OR COOLING PLATING AND ANODIZING SOLUTIONS



Specially designed for handling corrosives, this standard unit consists of two heat exchangers with the necessary valves, pipe, fittings and pump — all made of the well-known alloy, Duriron.

Duriron is a high-silicon iron with extreme resistance to corrosion from bright nickel and chrome plating solutions, anodizing solutions and many other corrosives.

Similar units are available with one to nine or more heat exchangers in banks, supported by one frame.

Prints showing typical layouts will be sent on request. Ask for Folder T.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON CO., INC. DAYTON, OHIO

Branch Offices in Principal Cities

DURCO Adv. 49-GM

or painted without thinning. The manufacturer claims that the material will not separate during shortage, does not constitute a fire hazard, and is non-corrosive and non-toxic.

Overspray coatings accumulating on spray booth walls are said to be readily removed if the booth is first coated with the spray booth coating. However, the manufacturer states that the accumulation of paint will not fall of its own weight.

Wil-Son "Instant-Shape" Portable Infra-Red Oven

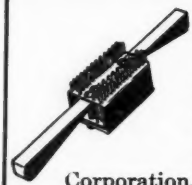
Equipped with a heavy portable base and large diameter Neoprene rubber wheels, the Wil-Son "Instant-Shape" Portable Infra-Red Oven, manufactured by the Wil-Son Manufacturing Corp., 700 Huston St., Cloverport, Ky., is adaptable to dry any shape of article. Due to the adjustable construction of each row of lamps, the entire assembly can be quickly shaped so as to obtain maximum infra-red heating efficiency, it is claimed. Adjustment is so universal that the oven shown in the illustration can be formed into a complete circle.

Wil-Son "Instant-Shape" Portable Infra-Red Oven

To move the oven, the operator merely places his foot at the base and tips it back, thereby permitting it to be rolled wheel-barrow fashion. After positioning the oven will not creep because of non-skid feet.

The Wil-Son Instant-Shape Portable Infra-Red Oven utilizes R-40 high efficiency reflector lamps which are slightly staggered for even heating. The backs of the lamps are totally enclosed with combination metal and asbestos panels to eliminate heat loss. The unit is available in sizes from 3 to 10 rows.

DRESS YOUR POLISHING WHEELS WITH A *UDYLITE* BUFF RAKE



Heavy aluminum construction, adjustable teeth. You need one for each wheel stand. Only $3.50. Write today to The Udylite Corporation, Detroit 11, Michigan.

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Ask for estimates and suggestions.

KALAMAZOO TANK & SILO CO. • **Kalamazoo 16, Mich.**

TORIT DUST COLLECTORS

Torit Dust Collectors are compact, self-contained units for trapping, and cleaning, dust-laden air from around grinding, cutting and polishing wheels. They are easy to fit into present and future production layouts.

win "converts" on this converted planer

Illustrated above is a special purpose grinder. A large farm tool company built it from an old planer, and to catch the dust, resulting from its operation, they used a Torit No. 75 Dust Collector equipped with a 4 inch flexible hose. The nozzle is permanently attached to the wheel guard. It moves with the grinding wheel and operates with practically 100% efficiency.

Torit Dust Collectors can be adapted for nearly every dust collecting job. Compact and efficient, they take up little room and, by recirculating the cleaned air, minimize heat losses.

For information and catalog showing the many types and sizes of Torit Dust Collectors available for immediate delivery, write:

TORIT MANUFACTURING CO.

314 Walnut Street — St. Paul 2, Minn.

DuBois Emulsion Cleaner

A ready-to-use emulsion cleaner designed to combine solvent and emulsion cleaning with the action of soil penetrating agents has been announced by The DuBois Co., Cincinnati 3, Ohio. Designated as "Mul," the new emulsion cleaner is said to resist hard water attack and the tendency to foam even in high pressure washers. Mul may be used in one-stage washers, as an additive to the rinse tank, or as a dip for interim rust protection.

Mul is recommended primarily for emulsion cleaning in industrial washers and for pre-wetting prior to alkaline cleaning. The product is said to be non-toxic, non-corrosive, and safe for use on various metals.

Improved Mercil Barrel Plating Equipment

Improvements in product design and materials of construction made on Mercil barrel plating equipment have been announced by the Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

HOLLAND SAYS:
START SAVING BY INCREASING PRODUCTION
Spray Booth — Leg and Floor Type. Available in all sizes.
Write for FREE folder "M" showing our wide selection of metal finishing equipment.
J. HOLLAND & SONS, INC.
MANUFACTURERS • DEALERS
276 SOUTH NINTH ST. • BROOKLYN, N. Y.

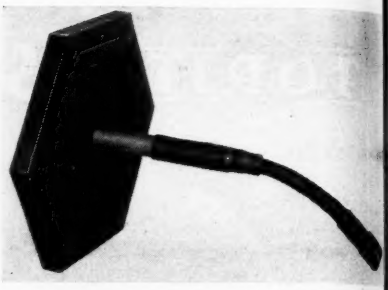

Fig. 1—New loose type dangler contact in H-VW-M Mercil type plating barrel

For those parts of the plating barre which should properly be protected b rubber linings, vulcanized rubber is agai available and is recommended for use o rubber coated equipment. Similarly, soli rubber barrel cylinders are again avai able fabricated from natural green ru ber which has been found to be superi to the black rubber substituted durin the war.

Rubber covered drive hangar arms a now covered with vulcanized rubber i stead of sprayed rubber. Single and do ble flexible dangler contacts are ava able, and when such contacts are su plied, no metal trunnions are needed. T cylinder rotates on Merlon bushings.

Barrel cylinders are also furnished Monel and fitted with Monel shafts, ha ger arms, and gears if the use to whic the product is to be put indicates that t use of this material would be advant geous. This material has been substitute for the phosphor bronze material fo merly used for parts in contact with ac solutions.

Width of tank in which plating barre are suspended has been increased to a low more room for removing cylinder and hangers from the tank. Hangers i rubber lined tanks will be equipped wit stop collars on the hanger pins so tha when the hanger is set in position in th saddles, the lower part of the drive ha ger will project into the tank and th hanger will clear the overflow when it lifted in and out of the solution.

Improvements made in the obliqu plating barrel may be summarized as fo lows: (1) instead of a bushing on th drive shaft there are roller bearing which strengthen the barrel and at th same time eliminate the possibility shaft wear; (2) the gear housing ha been redesigned so that two gears and a idler shaft have been eliminated; mai

Metal Finishing Supplies

RAKES . . . SPINNERS . . . TUBE POLISHING MACHINES

This Modern Wheel Rake Is Economical! It Saves Buffs

You'll find this modern wheel rake safe, fast and economical. It will recondition and shape polishing wheels and buffs with a minimum loss of material and without hazard. Write for complete details and prices.

Tube Polishing Machines Improve Workmanship

Rubber rolls tapered against each other drive tubing across face of polishing wheel or abrasive belt. Tube machine produces a uniform finish, free from spiraling. It polishes tubes from ¾" to 5" in diameter.

Work Holding Spinners For Uniform High Speed Polishing and Buffing

Here's a spinner for holding work and producing uniform high speed polishing and buffing. It has totally enclosed grease packed ball bearing construction. Removable fixture flange has machined face and screw holes for attaching wood block or other fixtures. Write for complete literature and price quotation.

Selective Distributorships Available

The **Manderscheid** COMPANY

810 FULTON STREET
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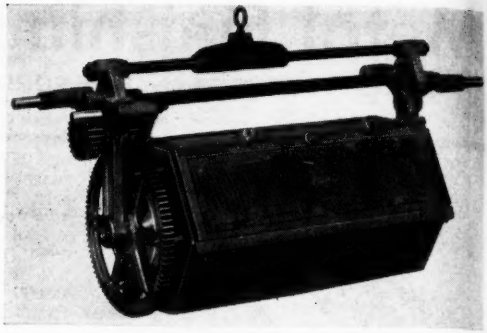
BACKSTAND IDLERS • CONTACT WHEELS • TUBE POLISHING MACHINE • SPINNERS • BUFFING WHEEL RAKES • POLISHING WHEEL BUSHINGS • POLISHING LATHE WRENCHES, FLANGES, COLLARS & NUTS • SCREW POINTS • EMERY TROUGHS • BALANCE WEIGHTS & WA S • TUBE SUPPORT STAND •

• METAL FINISHING SUPPLIES AND EQUIPMENT •

Fig. 2—Monel cylinder for H-VW-M Mercil type plating barrel



tenance cost is reduced and longer service obtained; (3) cylinders now have a vulcanized rubber covering instead of sprayed rubber; (4) a new channel base gives greater stability and strength.

Isopol

An original development of the Union Bay State Chemical Co., 50 Harvard St., Cambridge, Mass., Isopol is a hydrocarbon resin with moderately high molecular weight, made up of approximately 75 parts styrene and 25 parts isoprene, which is exactly the opposite proportions to those usually found in synthetic rubber.

Now in pilot plant production, Isopol is clear, hard, nearly water-white in appearance, possesses many of the chemical properties of rubber, and is unique in that it is completely soluble in petroleum naphtha. It is best described as a modified polystyrene in which the isoprene acts as an internal plasticizer. Thus, the advantages of polystyrene have been retained, while the disadvantage of brittleness has been partially eliminated.

Isopol resin may be used in a solution, in an emulsion, or as a solid. One possible use in the finishing field is as an ingredient in hot melt coatings. Here it is felt that the colorless, odorless, and chemically inert characteristics of the resin should prove very valuable. The major limiting factor in tests so far conducted for such applications is that the resin tends to be slightly tacky and presents a blocking problem.

GOLD PLATING SOLUTIONS

In All Colors

Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant

Proven Quality by the Acid Test

Write or call our experts about your plating problems

Davis-K-Products Co.

54 West 22nd St., New York 10, N. Y.
Oregon 5-0094
5-0095

Daybrite Copper Plating Process

An improved acid copper bath formulated to make possible plating speeds up to 0.001 inch in 10-15 minutes, and to eliminate the faults inherent in the original method, has been developed by the Dayton Bright Copper Co., 1030 Valley St., Dayton 4, Ohio.

The Daybrite method, as it is called, employs no cyanide or hot baths, and because it gives off no offensive fumes or odors, requires no ventillation. The smooth, dense deposits tend to fill out minor defects in the base metal, increasing corrosion resistance and simplifying or eliminating buffing operations before the nickel plating cycle, thus reducing polishing time and costs, it is claimed. Daybrite is also said to be suited to applications in electroforming operations, particularly in the recording industry.

Complete installation service is available through the company and its representatives, ensuring correct application of equipment and operating techniques to provide the maximum benefits possible under the improved plating method.

New Iridite Bright Dip for Zinc

Allied Research Products, Inc., 4004 E. Monument St., Baltimore 5, Md., has announced a new Iridite Bright Dip designed especially for use in automatic zinc plating installations. A variation of standard Iridite Bright, this formulation makes it possible to obtain a bright

That delivers More than the Goods!

The MITCHELL-BRADFORD "Package" delivers far more than a range of proven metal finishes, heat treating materials and metal cleaners. It gives you an all-inclusive service for setting up and maintaining the most efficient metal finishing and heat treating operations known to modern chemical engineering.

Mitchell-Bradford engineers are skilled in evaluating the needs of a plant. Where specific recommendations are being sought for modern equipment, stepped up production rates, or new, money saving methods, a Mitchell-Bradford engineer is ready with detailed information, facts that will help to make your process more productive. This extra value in the Mitchell-Bradford "Package" ensures a better-than-called-for performance for every one of the well known Mitchell-Bradford products listed below.

BLACKENING PROCESSES FOR METALS

BLACK MAGIC for Steel and Iron
BLACK MAGIC for Zinc, Zinc plate, Zinc die castings and Cadmium Plate
BLACK MAGIC for Copper and its Alloys

METAL CLEANERS

Cleaner #7 Still, soak cleaner
Cleaner #9 Heavy duty soak cleaner
Cleaner #12 Reverse current cleaner
Cleaner #20 Non-etching Aluminum Cleaner
Cleaner #30 Etching-type Aluminum Cleaner
Cleaner #25 Brass Cleaner (non-oxidizing)
Cleaner #66 Solvent Cleaner (emulsion type)
Special Cleaners — formulated for specific applications

HEAT TREATING MATERIALS

QUICK-CARB, #20 — #40 — #60, Liquid Bath Carburizing Salts.
QUICK-TEMPER TEMPERING AND DRAWING SALTS — 275°F. and 420°F. Melting Points.
NEUTRAL SALTS — For Complete Range of Temperatures.

PROTECTIVE FILM FINISHES

WITCH-DIP, Wax Base Compound
WITCH-OIL, Water Displacing Corrosion Inhibiting Oil
FINISH No. 146, Hard Protective Coating and Paint Bond
SILCO — An inorganic, low-temperature bake, vitreous type finish. Rust, acid and abrasion resistant. All colors.

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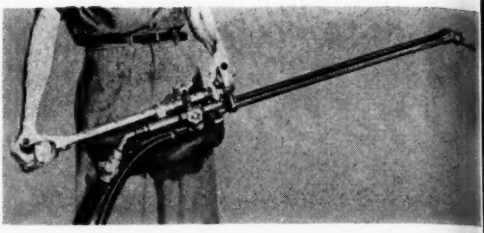
MODERN METAL FINISHES
2446D MAIN ST., STRATFORD, CONN.

BLACK-MAGIC OXIDE BLACKING SALTS
WITCH-DIP & WITCH-OIL FINAL FINISHES

SILCO *Glass-Base* PROTECTIVE COATING
HEAT TREATING SALTS. CLEANERS. ETC.



Oakite Model 481 Solution-Lifting Steam Gun

equipment of the Oakite Model 481 Solution-Lifting Steam Gun, designed to facilitate volume cleaning operations in industrial plants.

Outstanding features of the gun, according to the manufacturer, is its ease of handling, made possible by its special construction. The Model 481, which has an overall length of 5 feet, is ruggedly constructed and so balanced that it may be used over extended periods without tiring the operator. Two spade-type insulated handles are provided and are so situated that each of the operator's hands support the same weight during a high pressure steam-cleaning operation. The forward handle of the gun remains stationary in the operator's grasp as the gun is rotated, while the rear handle is easily turned to rotate the gun when cleaning "underneath" and hard-to-reach surfaces. Steam and solution hoses are connected to the gun by swivel joints and remain stationary when it is rotated, thus eliminating twisting of hose lines during the cleaning operations. A special safety feature is a reinforced rubber apron backing up the steam valve and other hot fittings to protect the operator.

The Oakite Model 481 Solution-Lifting Steam Gun develops sufficient vacuum to discharge cleaning solutions to a height of over 12 feet to permit rapid, thorough cleaning of large equipment surfaces, the manufacturer states.

Polishing Specialists

During our 50 years practical experience in the polishing rooms throughout North America we have noted many changes. While the machines have revolutionized the industry, there will always be hand jobs where the fundamentals are about the same as they were many decades ago. Here there are no further short cuts available other than those known to competent metal finishing authorities.

We have a complete line of wheels and polishing wheel service is always available to our customers.

The trend of the times is on the way back to a better finish, so for good polishing write for our catalog.

PRESSED LEATHER WHEEL CO.
HERKIMER, N. Y.

— Oldtime Polishers —
Oldtime Wheel Builders

Penfield Water Demineralizer

Designed for use to convert ordinary tap water to the chemical equivalent of distilled water, a new cartridge type water demineralizer has been announced by the Penfield Manufacturing Co., Inc., Meriden, Connecticut.

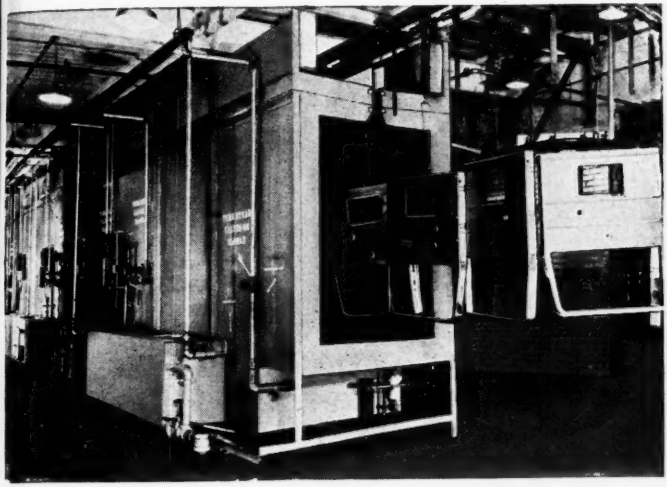
When the demineralizer is attached to the water line, faucet water must pass through a series of four beds of ion exchange resins. The demineralizer is said to remove sodium, potassium, calcium, magnesium, iron, copper, lead, as well as sulfates, carbonates, and chlorides. The resulting water when used in plating solutions, especially solutions of precious metals, is said to assist in producing purer plating solutions and better plating.

Duplex Film Applicator

A new instrument for matching colors and for comparison of gloss and capacity in paint, developed by W. H. Biddle, chief chemist, General Paint Corporation of Canada, Ltd., is being manufactured by Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda, Maryland.

Known as the Duplex Film Applicator, the instrument is designed to fulfill certain essential requirements of color matching; namely, that paint films for color comparison: be applied on the same surface; have the same web thickness; meet edge to edge in a straight line with-

CONTINUOUS PHOSPHATE COATING OF STEEL PARTS BEFORE PAINTING



Cab doors for AUTOCAR Trucks being automatically cleaned, phosphate coated and dried in a METALWASH "DURIDINE" Machine.*

Photo Courtesy of Autocar Co., Ardmore, Penna.

"Duridizing"* in this METALWASH machine provides an ideal surface for a lasting paint finish on truck body parts. Cab doors, fenders, hoods, and other parts move through the machine at a speed of 8 feet per minute. Cleaning and phosphating are entirely uniform because the cycle is automatically controlled. Continuous operation built around the plant conveyor line eliminates handling problems and increases production.

METALWASH engineers are experienced in all phases of cleaning and treating metal surfaces prior to painting. Write today without obligation for further information.

o *Trade Mark Reg. U. S. Pat. Off. by American Chemical Paint Co., Ambler, Pennsylvania*

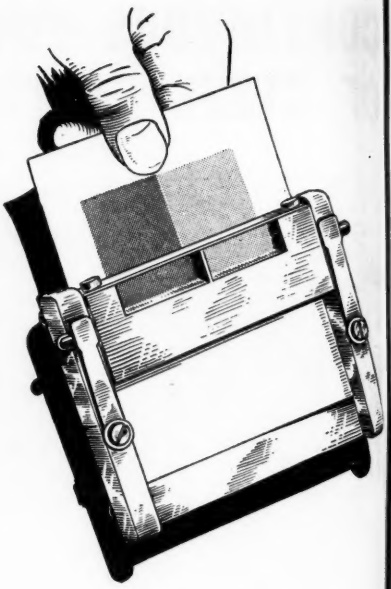
METALWASH MACHINERY CORP.
149-155 SHAW AVENUE IRVINGTON 11, NEW JERSEY

out merging; be applied at the same time on thin material such as coated paper.

The main part of the applicator is the casting block. The doctor blade, which is adjustable, is held to the forward edge of the block by two screws. The milled-out cavities of the block, together with the blade, forms two compartments with narrow open slots at the bottom. They are separated by a partition which comes to a sharp edge at the bottom. On the bottom of the block this pressure area back of the slots ensures uniform flatness of the paper immediately behind the blade.

The other part of the applicator is the table with which the casting block is usually used. The raised sides guide the paper and are slotted to hold the block in position. The spring clips bear on the pins which project from the ends of the block and hold down firmly against the paper. They spring aside in order to allow removal of the block.

A strip, or a number of strips, of coated paper is placed on the table behind the guides, the casting block is placed in position over it, and the spring clips are closed. A small amount of a control paint is then filled into one of the compartments from the end of a spatula and a like amount of the comparison paint



Duplex Film Applicator

from the batch being ground is filled int the other compartment. The paper i then drawn under the block at a slo even rate by clasping the paper betwee the thumb and forefinger and pulling i a slightly downward direction.

The Duplex Film Applicator can b used with paints, enamels, lacquers, an so on, of a wide range of consistency, i is claimed.

CLEAN ALUMINUM

HOW?

Aluminite will remove buffing compounds without scratching or tarnishing. This increases the final sheen which pays-off in increased consumer acceptance. Further facts on request.

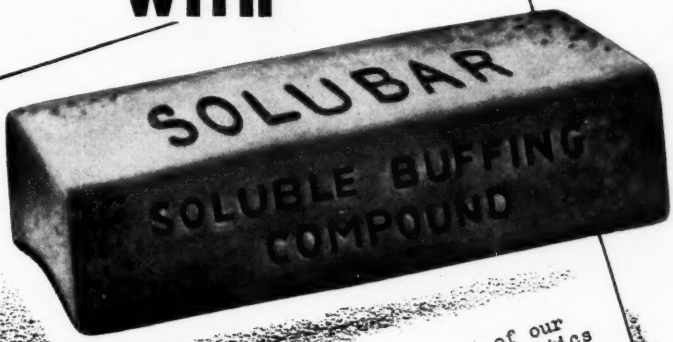
Stuart INDUSTRIAL SERVICE, INC.

166 W. Jackson Blvd. Chicago 4

New Phosphoric Acid Cleaners

Two new metal conditioners that fea ture new developments in phosphori acid cleaners have been announced by Klem Chemicals, Inc., 14401 Lanson Ave. Dearborn, Mich. The products are known as Rust-Sol No. 123 for wash-off or immersion type of cleaning and Rust-Sol No. 113 for wipe-off or hand application. According to the manufacturer, both cleaners feature exceptional wetting and dispersion qualities. They are said to emulsify all oil and grease and penetrate the oil coating to the steel surface to dissolve all rust and oxide with a reaction that leaves a protective iron phosphate

IMPROVE PRODUCTION with



We have adopted Solubar for most of our buffing operations. The buffing characteristics of this material are at least equal to anything we have tried, and the ease of cleaning after buffing, even after several days, is far superior to any other buffing compound which we have tried so far.

Of the several so-called soluble buffing compositions which we have tried, yours is the only material which has proven readily soluble in standard alkaline cleaning operations, prior to electro-plating.

Extract from a letter in our files from a large manufacturer of metal specialties.

SOLUBAR easy-cleaning buffing compounds are available in tripolies, limes, cut and color, chrome rouge and red rouge compositions.

Write for further information, or samples, specifying type desired.

APLEY N. AUSTIN COMPANY

BUFFING AND POLISHING COMPOUNDS — INDUSTRIAL METAL CLEANERS

— SOLUBAR —

WATER SOLUBLE COMPOUNDS

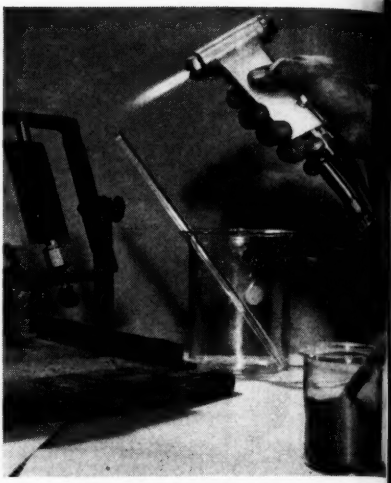
SALES OFFICE: 75 FEDERAL ST., BOSTON 10, MASS.

coating. Welding flux, soldering acids, and other corrosive salts are dissolved and neutralized by these two cleaners, it is claimed.

Rust-Sol No. 123 is recommended for use diluted with 3 to 4 parts of water. This same cleaner used at approximately ½ of 1 per cent by volume is said to be an excellent rinse after alkali stripping to provide a positive base for painting. Rust-Sol No. 113 can be used diluted with 2 to 3 parts of water. It is said to be non-toxic, non-inflammable, and non-corrosive.

Schori Laboratory Size Powder Flame Spray Pistol

The Schori Process Division, Ferro-Co Corp., 8-11 43rd Rd., Long Island City 1, N. Y., has added to its line of production spray pistols a small size flame spray pistol developed for use in laboratories where grams or ounces of powder may be sprayed instead of pounds. This laboratory size pistol will spray any metal or plastic powder, such as fluorothene, polyethylene, boron, aluminum, or mixtures of metal and plastic powders.



Schori Laboratory Size Powder Flame Spray Pistol

The Schori pistol may be used for a wide variety of applications which, in addition to spraying, include heating, brazing, or soldering.

FOR SAFETY AND SPEED . . . JUST STRIP!

with

Red-Skin Brand Strippable

SPRAY BOOTH COATING

Tough film, pigmented white for light reflection. Easily strips off in continuous sheet, carrying accumulated overspray on film. Time and labor-saving. Can be sprayed or brushed.

Trial Offer—5 Gallons $13.75 F.O.B. St. Louis, or write for sample panels.

DENNIS CHEMICAL CO.

2701 PAPIN ST. ST. LOUIS 3, MO.

Detrex 79 Combination Cleaner and Phosphate Coating Compound

A cleaning and phosphate coating material for use on steel and other ferrous metals to provide a base for paint coating has been placed on the market by the Detrex Corp., Detroit 32, Mich. Known as Detrex 79, the material is a yellow non-corrosive cleaning compound in dust-free powder form and is used in heated water solutions at low concentrations for the production of a light crystalline phosphate film on metal parts. The parts, after processing, are said to have a clean water-wet surface that dries to a typical uniform blue-gray finish, either in the air or in a blow-off stage following the cleaning-coating process.

Claimed to be advantageous in reducing cost, time, and the number of operations in a production setup, the combination cleaner and coating compound efficiently removes light soils and oil films and a

Preclean with MAGNUSOL

Instrument stamping before cleaning.

Pre-cleaned with Magnusol. Note water-break.

Electro-cleaned with Magnus 94XX.

- **To Remove Stubborn Buffing and Polishing Compounds.**
- **To Insure Solid Particle Removal, Particularly After Deep Draws.**
- **To Remove Slushing Oils.**
- **Wherever It Is Desirable to Cut Down Time of Contact with Alkaline Cleaning Solutions.**

Precleaning with Magnusol insures the removal of solid dirt particles which are usually unaffected by vapor degreasers or solvent cleaners. Surfaces are physically clean.

It insures the removal of all stubborn dirts which tend to resist alkaline cleaning action in the preparation of a chemically clean surface for plating, vitreous enamelling, etc.

Proper precleaning can cut your over-all finishing costs a great deal. Ask us for specific data in connection with *your* processes.

MAGNUS CHEMICAL COMPANY • 208 South Ave., Garwood, N. J.

In Canada—Magnus Chemicals, Ltd., 4040 Rue Masson, Montreal 36, Que.

Service representatives in principal cities

IN METAL CLEANING IT'S

Magnus

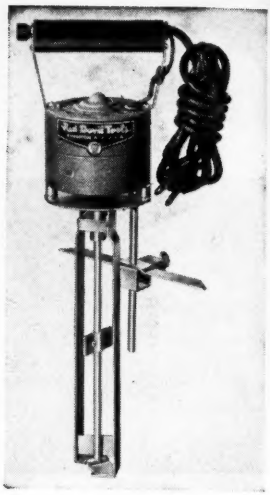
CLEANERS • EQUIPMENT • METHODS

the same time deposits the tightly adhering phosphate coating on the cleaned base metal.

No special equipment is said to be required for the application of Detrex 79 as the solution may be used in open tanks or continuous washing machines, especially of the spray type—either single or multiple stage. The coating is secured in a minimum of time and space requirements for equipment, it is claimed. The time required in either mechanical or still tank processing is one minute spray contact or immersion for a desirable phosphate coating.

Red Devil No. 31 Junior Paint Mixer

Known as the Red Devil No. 31 Junior Paint Mixer, a handy pocket-sized replica of the No. 31 Paint Mixer which mixes paint in from 5 to 50-gallon cans has been announced by Red Devil Tools, 130 Colt St., Irvington 11, N. J. Its primary purpose is to provide the master painter and finisher with a mechanical paddle sufficiently compact that it may be conveniently carried to the job in a tool box or kit.



Red Devil No. 31 Junior Paint Mixer

The Red Devil No. 31 Junior Paint Mixer is recommended for handling cans of one gallon or less and should not be used for thoroughly mixing pigment or oil or as a general paint conditioner.

The tool is driven by a fractional horsepower motor which operates on 110-volt a.c. and is directly connected to the drive shaft which, in turn, is equipped with an adjustable paddle. The mixing parts can be immediately snapped apart from the motor for carrying and cleaning by twisting the baffle plates and removing the agitator. A splash plate prevents the material in the can from getting out of hand. A set screw clamp is supplied with the tool to hold the mixer in the can, but the tool can be readily used without the clamp if preferred.

Strip Copper With

McKeon's
"Liquid Sulphur"

1. Strip evenly
2. Load to capacity
3. Handle work in bulk
4. No corrosive fumes
5. No possibility of etch
6. No hydrogen embrittlement
7. Satisfaction guaranteed.

Sulphur Products Co.

GREENSBURG, 6, PA.

New Dip Treatment for Zinc

United Chromium, Incorporated, 51 E. 42nd St., New York 17, N. Y., has announced the development of Unichrome Dip Compound 95, designed and used to produce corrosion-resisting, conversion coatings on hot dipped zinc, plated zinc and zinc die castings. Depending on the degree to which Compound 95 is diluted one of the following finishes may be pro-

YOU CAN HAVE

All the advantages of the new Plastisol type of insulation at a surprisingly low cost per rack. Paste type insulation is a 100% solids dispersion of the finest synthetic resins. The Paste is thick enough so that a single dip makes a very thick coating. Then a quick oven bake to convert the mass into an almost permanent insulation that will last for months. So quick to do and so little labor cost makes Paste the preferred insulation for all types of racks for every plating service.

REAL PROTECTION

BUNATOL No. 1000 is a thick red fluid Paste that fulfills every rack insulation requirement. It has excellent adhesion and provides a thick single dip coating that rinses freely, does not affect any plating solution, stands up in all cleaners except degreaser, and does not carry over solutions. Use it on plating racks, anodizing racks, anode baskets, dipping baskets and work fixtures. The actual cost is low and handling is simple. Let us give you the facts.

ON YOUR RACKS

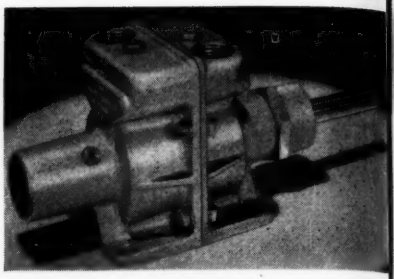
Nelson J. Quinn Company • Toledo 7, Ohio

duced: (1) on zinc plate, a clear bright finish resembling chromium, or an olive drab finish, (2) on zinc die castings, a clear, bluish finish or an olive drab, (3) on hot dipped zinc, a bright spangled finish or an olive drab, and (4) on all zinc, a coating which serves as an excellent base for paint, lacquer, or enamel.

The process is said to be especially applicable for finishing wire goods, small parts, and parts on which it is economically inadvisable to deposit enough copper, nickel, and chromium to provide the necessary corrosion resistance. Typical of the parts now being given the bright, chromium-appearing finish are ice skates, refrigerator shelves, screws, hinges, and fan guards. Parts being processed in the olive drab finish include die cast automotive fuel pumps and carburetor bodies.

New Eco Gearless Pump

A gearless pump for the handling of industrial liquids has been announced by the Eco Engineering Co., 12 New York Ave., Newark 1, N. J., manufacturer of pumps for the industrial, farm and marine fields.



New Eco Gearless Pump

The new Eco Gearless Pump includes several special features and improvements which are said to make it ideal for the handling of a wide range of liquids and viscous fluids. Chief among the improvements is the new dual eccentric piston design which gives a strong flow against pressure.

The pump body is made of sturdy naval bronze forgings on stainless steel precision castings for maximum wear resistance. The pump is said to operate quietly and smoothly. Self-lubricating bearings installed in the pump are said to eliminate problems of lubrication and at the same time provide freedom from pump grease or oil fouling of intake or discharge lines thus obviating contamination of the liquid handled.

The Eco Gearless Pump is available in four sizes, ¼, ⅜, ½, and ¾ inch, with capacities ranging from 1 to 12 g.p.m. varying with pump speed. The pump may be used against pressures ranging from 0 up to 100 lb. per square inch, and can be run at speeds from 200 to 2,400 revolutions per minute.

New Room Temperature Strippers for Organic Finishes

Enthone, Inc., 442 Elm St., Dept. PF, New Haven, Conn., has announced the development of two room temperature strippers for synthetic enamels; namely, Stripper S-17 and Stripper S-19.

Stripper S-17 is stated to be a clear, quick-evaporating stripper used at room temperature for removal of all types of synthetic enamels, including heavy coatings of enamels that accumulate on work holders and hooks. In such cases, the various layers of enamel exfoliate, leaving the work holders clean. Stripper S-17 is

CUT DOWN REJECTS
WITH
ORVUS
IN YOUR METAL CLEANING BATHS
You'll find this synthetic detergent effective
—as a wetting agent
—as an emulsifier
—in dispersing lime soaps which might cause poor plating if allowed to deposit on the metal
—in speeding rinsing — minimizing water marks
Write for further information about Orvus to
PROCTER & GAMBLE • Cincinnati 2, Ohio

You can produce on any material the following surface finishes:

FELT - SUEDE LEATHER - MOHAIR VELOUR - VELVET - CARPET

FUNCTIONAL USES

Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for surfacing all sorts of materials to provide

TEMPERATURE INSULATION • SOUND DEADENING • INTEGRAL GASKETS • SHOCK ABSORBING SURFACE • NON-MAR SURFACE • NON-GLARE SURFACE

DECORATIVE USES

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

FURNITURE UPHOLSTERY • SUEDE LEATHER • INTERIOR AND DRAPERY FABRICS • VELVET • VELOUR • MOHAIR • CARPET

with these patented and trademarked Rayco specialties:

FELT AND SUEDE SURFACE

*"Raymix"—a flock of rayon fibres, trademarked under U. S. No. 427949 to produce a suede effect of utmost realism on any surface.

*"Kingcote"—a cotton flock trademarked under U. S. No. 423572, producing a suede effect at minimum cost.

MOHAIR, VELOUR AND VELVET SURFACE

"Raycote"—a flock composed of uniformly cut rayon fibres to produce on any surface a pile effect such as velvet, plush, or velour. Made under U. S. Patent No. 2014947.

SYNTHETIC CARPET

"Harecote"—a flock composed of animal fibres, produces a durable carpet or rug material.

Request Free Color Card of Actual Samples

Rayon Processing Co. of R. I., Inc.

*Registered Trademark

PIONEER PRODUCERS OF SURFACE COATING FLOCKS

65 MOSHASSUCK STREET • PAWTUCKET, R. I.

POLLAK PAINT CO.
715 Main St.
Buffalo, N. Y.

LAMBERT-NEW ENGLAND CO.
79 Sudbury St.
Boston, Mass.

H. R. MEININGER CO.
409 16th St.
Denver, Colo.

J. GORDON SMITH CO.
3901 Main St.
Dallas, Texas

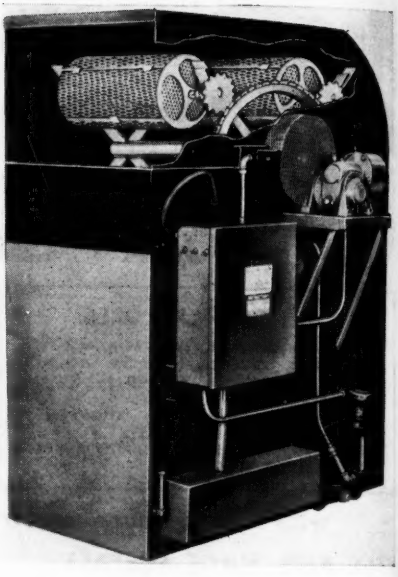
particularly recommended for the removal of clear synthetic enamels from highly polished surfaces, such as brass, gold plate, and silver. The manufacturer states that it does not tarnish metals and has no significant odor.

Stripper S-19 is similar to Stripper S-17 in its action and appearance except that it is slightly ammoniacal in composition and is used in certain special cases for removal of synthetic enamels where Stripper S-17 is not satisfactory. Both strippers are used with water seals to minimize evaporation losses. Rinsing is not necessary following the use of these strippers, it is claimed.

The work to be stripped is merely immersed in the stripper at room temperature. After a few seconds to several minutes, when the enamel has been completely removed from the surface of the metal, the parts can be removed. The stripper then evaporates quickly.

Phillips Tumbling Rotomatic Degreaser

The Tumbling Rotomatic, a conveyorized vapor degreaser, is now being manufactured by the Phillips Manufacturing Co., 3475 W. Touhy Ave., Chicago 45, Ill. The necessary cleaning of innumerable small parts is said to be easily and economically accomplished with the unit. When the parts are placed in baskets for degreasing, the baskets are tumbled, thus eliminating the cupping of solvent in crevices and hollows.



Phillips Tumbling Rotomatic Degreaser

The tumbling baskets are rotated by a small spur gear, which in turn rotates on a large ring gear. As the reel rotates, the tumbling baskets are in turn rotated around this ring gear as they dip into the vapor; still tumbling, they emerge on the other side. The baskets make approximately nine complete revolutions to every revolution of the reel.

Each tumbling basket is fitted with a tubular shaft with a spring stub-shaft carried on one end for loading and unloading, thus making the tumblers readily removable by merely compressing the spring.

Tuch Protective Paper

Tuch Protective Paper, an improved protective paper that will neither stain

SOLVENTS RECOVERED BY
THE LOFGREN PROCESS

We RECOVER YOUR
SOLVENTS and THINNERS
From - Sludge - Waste - Wash - Spoiled Lacquers, etc.
Each customer's shipment, whether one drum or a carload, receives *proper and separate treatment.* Write to:
SOLVENTS RECOVERY SERVICE, INC.
1019 Broad Street or Newark, N. J.
HAMMOND SOLVENTS RECOVERY SERVICE
241 Brunswick St. Hammond, Ind.

For a real good polishing job use
Keystone TURKISH Emery
FRESH SUPPLY AVAILABLE
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

nor leave deposits of adhesive when stripped from the surface which it protects, is now being produced by the Technical Tape Corp., Morris Heights, New York 53, N. Y. This protective sheet is made from a specially prepared crinkleback paper, which provides for maximum flexibility and resistance to abrasion. Its adhesive coating is clear and very low in tack.

Manufactured in 40-inch widths and 100 yards long, Tuch Protective Paper is claimed to have many uses, the principal one being to protect finished surfaces from damage during fabrication and shipment.

Practi-Kreme Skin Protector and Cleaner

Considerable savings under liquid or scrubber soap costs are claimed for the Practi-Kreme dispenser system by Chemical Specialties, Inc., 86 Waltham Ave., Springfield 9, Mass. Chief advantage of using Practi-Kreme is said to be its protection against dermatitis.

The attractive, rugged, cast aluminum dispenser, loaned free to the Practi-Kreme user, is installed in the plant near the machines to dispense the cream before work as a protector and afterward as a deep penetrating, highly efficient skin cleanser.

DuBois Terj and Ferro-Terj Metal Cleaning Compounds

The DuBois Co., Cincinnati 3, Ohio, announces two new alkaline metal cleaning compounds, Terj and Ferro-Terj. Terj is a metal cleaner designed for removing light shop soils and for use in industrial washers when cleaning aluminum. The manufacturer states that it will not pit, corrode, or discolor aluminum when used in a spray washer.

Ferro-Terj is a heavy-duty metal cleaner which is designed to remove tenacious soils, such as drawing compounds, from steel parts.

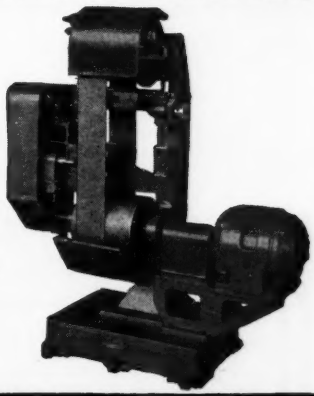
Both Terj and Ferro-Terj are free-rinsing and leave no deposits on finished work to interfere with susequent painting or plating operations, it is claimed.

Production

HIGH-SPEED TOOL SHANK POLISHER

SCREW DRIVERS
AUGER BITS

and many other shank tools polished to a bright, uniform finish with amazing speed — A newly developed machine using abrasive belts up to 9" wide to conform to length of surface to be polished—Also furnished with belts up to 14" wide for longer work.



WRITE FOR FULL DETAILS!

Production MACHINE COMPANY GREENFIELD, MASSACHUSETTS, U.S.A.

PRODUCT LITERATURE

The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

Du Pont Sodium Hydride Descaling Process, its advantages and features are discussed in an eight-page bulletin issued by E. I. du Pont de Nemours & Co., Electrochemicals Dept., Wilmington 98, Delaware.

Roberts Rouge Data Sheet. Suggestions and instructions for getting most efficient results from Roberts Rouge Perfection Greaseless Compounds, glue base abrasive compositions which are applied directly to cloth revolving buffs, are presented in detail in a data sheet now being distributed by The Roberts Rouge Co., Stratford, Connecticut.

General Chemical Flourine Division, 40 Rector St., New York 6, N. Y., is distributing **Technical Information Manual LTF-1** which contains extensive data on bath make-up and operation, bath control analytical methods, analysis of deposits, and so on, in connection with the plating of lead-tin alloys.

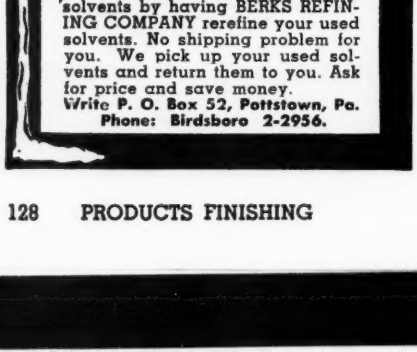
"Triclene" D Folder. A new improved metal degreasing solvent known as Triclene D is discussed in a six-page pocket-size folder available from E. I. du Pont de Nemours & Co., Electrochemicals Dept., Wilmington 98, Delaware.

H-VW-M Brushes. Its complete line of brushes for use in the finishing industry is illustrated and described in detail in Bulletin BR-103 available from the Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

Unichrome Alkaline Copper Plating is discussed in a six-page folder available from United Chromium Inc., 51 E. 42nd St., New York 17, N. Y. Properties and complete specifications of Unichrome Alkaline Copper are presented and its advantages cited.

Taylor Guide to Correct Instrument Selection. Completely revised, Bulletin 98170 has been published by the Taylor Instrument Companies, Rochester 1, N. Y. In addition to presenting a comprehensive bird's-eye view of the companies' entire industrial instrument line, the field of application of each type of instrument is covered, as well as its principle of operation and range limits.

Bulletin BC-104, presenting a complete line of full disc and pieced buffs, is now being distributed by the Hanson-Van Winkle-Munning Co., Matawan, N. J. Also included in the bulletin is a list of the company's line of buffing compositions together with recommendations regarding proper use of each product.


BERKS REFINING
Company
Save money on your degreasing solvents by having BERKS REFINING COMPANY rerefine your used solvents. No shipping problem for you. We pick up your used solvents and return them to you. Ask for price and save money.
Write P. O. Box 52, Pottstown, Pa.
Phone: Birdsboro 2-2956.

ALLWOOD

"Vienna Brand" Lime

Made from Limestone that is identical in chemical analysis and geological structure with European Imported Lime. Tests show a "lime cake" made from Allwood "Vienna Brand" Lime equals the finish made from imported lime.

WRITE FOR FULL PARTICULARS

ALLWOOD LIME COMPANY

Manitowoc • Wisconsin

Excelsior Sheet Grinding and Polishing Machine is illustrated and described in detail in Circular No. 27-K now available from the Excelsior Tool & Machine Co., 100 Ridge Ave., East St. Louis, Illinois.

Barnstead Demineralizer Bulletins. The Barnstead Still & Sterilizer Co., Inc., 2 Lanesville Terrace, Forest Hills, Boston 31, Mass., is offering bulletins describing the Barnstead Bantam Demineralizer for low-capacity requirements and the Barnstead Type "R" Demineralizer for installations requiring a capacity of from 5 to 100 gallons of mineral-free water per hour.

Binks Paint Circulating Bulletin No. 550. Paint circulating systems which enable manufacturers to finish parts and sub-assemblies in different departments of a plant and have them meet on the assembly lines in perfect color match and finish are described in Paint Circulating Bulletin No. 550, available from the Binks Manufacturing Co., 3114 Carroll Ave., Chicago 12, Ill. All the advantages derived from paint circulating systems are presented, together with mechanical and engineering details.

"Hints on Finishing Economies" is the title of a 20-page booklet prepared by E. I. du Pont de Nemours & Co., Finishes Div., Wilmington 98, Del., which presents the story of economies obtainable through the use of correct painting practices. How to get maximum production out of materials and equipment is outlined and many illustrations provided.

General Ceramics Chemical Process Equipment. The General Ceramics and Steatite Corp., Chemical Equipment Division, Keasbey, N. J., has available Bulletin No. CHE-R3 featuring full specifications for its chemical stoneware (Ceraware), chemical porcelain (Cerawite), and impregnated graphite (Impervite). Clearly illustrated and described in detail is the company's complete line of process equipment and supplies. Specific recommendations of the various products are made for specialized industrial needs.

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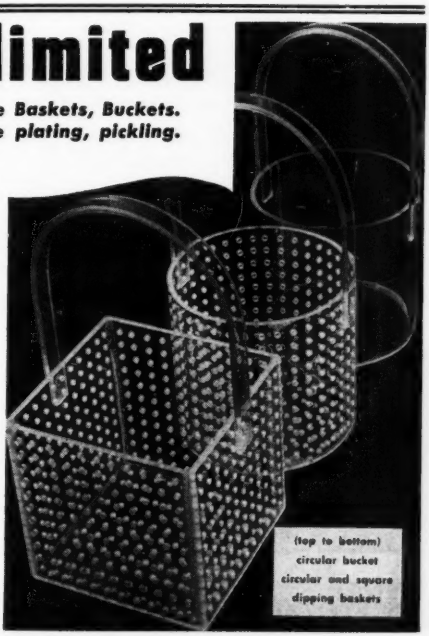

(top to bottom) circular bucket circular and square dipping baskets

Technical Data Bulletin No. T504, describing Copeel Strippable Plastic Coating, is being issued by the Maas & Waldstein Co., Newark 4, N. J. Properties of and uses for Copeel are listed in the bulletin, as well as application methods.

The installation and operation of the Unichrome Copper Plating Process for still and conveyor tanks using prepared salts are described in detail in **Unichrome Copper Bulletin P-2d** now being issued by United Chromium Inc., 51 E. 42nd St., New York 17, New York.

"Alumatreet for Phosphatizing Aluminum" is the title of a four-page folder issued by the Farrelloy Co., 1243-45 N. 26th St., Philadelphia 21, Pa. The folder describes how Alumatreet acts to protect aluminum surfaces from corrosion. The properties of the coating are described and methods of application are discussed.

"Fullergript Power Driven Brushes" is the title of a 34-page two-color booklet issued by The Fuller Brush Co., Fuller Park, Hartford, Conn. The booklet describes the construction and manufacture of Fullergript Brushes, pointing out the wide field of application for brushes made in this manner. Industrial applications of Fullergript Brushes are illustrated with on-the-site views and described in the captions accompanying the photographs. Properties of Fullergript Brushes are outlined in the booklet and a brief statement concerning Fuller service and engineering facilities is included.

Duranite H Folder. The Industrial Finishes Dept., Atlas Powder Co., Wilmington 99, Del., has available a folder outlining the field results and laboratory tests, extending over a two-year period on its new organic finish Duranite H. The folder lists results of comparative tests of finish durability, heat resistance and impact adhesion.

"Technical Instructions for Cobalt-Nickel Plating Processes" is the title of a 16-page two-color illustrated bulletin issued by the Hanson-Van Winkle-Munning Co., Matawan, N. J. The Type 9B bright nickel process, the Type 5 (5 per cent cobalt) process, and the Type AA (18 per cent cobalt) process are discussed in the bulletin with respect to solution preparation, the effect of the various constituents on bath operation, solution operation and control, solution purification, and the effect of impurities. Uses for and applications of the various processes are suggested.

"Link-Belt Overhead Trolley Conveyors Make Ceilings Pay Dividends" is the title of a new 28-page illustrated Book No. 2330, published by the Link-Belt Co., 30 N. Michigan Ave., Chicago 1, Ill. Some 80 illustrations depict a great variety of actual installations and show the flexible adaptability of this type of conveyor. Trolley conveyors that are electrified with bus bars along conveyor track, to provide current for continuous testing of such articles as electric fans and freezer boxes are shown. Another interesting feature, picturewise, is the great variety of specially made hangers that are used for suspending the product (either singly or packaged) from the endless conveyor chain.

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Micromax Model S Indicating Recorders and Controllers. The Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa., has prepared Catalog ND44(1) which presents the company's complete line of strip-chart Micromax recorders and controllers for measuring a wide variety of process variables—temperature, speed, gas analysis, electrolytic conductivity, pH, and so on. Suggested chart numbers are listed for the most commonly used ranges, together with Model S accessories and supplies.

NEW BOOKS

Design of Industrial Exhaust Systems. Second edition. By John L. Alden, Published by The Industrial Press, 148 Lafayette St., New York 13, N. Y. 252 pages. 220 drawings and diagrams. Price, $3.50.

This book shows how to design, build, or buy an exhaust system that will remove dust, shavings, fumes, and so on, in order to meet the requirements of the law or of industrial hygiene. Illustrated with many drawings and diagrams, the book covers exhaust ventilation, low pressure pneumatic conveying, the design of hoods, piping and structural details, and the selection of dust separators, and centrifugal and axial flow exhaust fans. The text is in straightforward engineering terms, and tabulated designing data of practical value are included.

Atlas Surface Active Agents. By the Industrial Chemicals Dept., Atlas Powder Co., Wilmington 99, Del. 70 pages. Paper covers. Price, $1.00.

The book discusses surface active agents and their industrial applications. The chapter headings are as follows: Surface Activity and Surface Active Agents; General Industrial Applications of Surface Active Agents; Surface Active Agents in Insecticides; Detergents; Surface Active Agents in Textile Processing.

Chemical properties of the surface active agents are discussed in detail and additional information is furnished in the form of several complete tables listing agent properties. Numerous illustrations add to the interest of the presentation and a complete index refers the reader to the various products in which he may be interested.

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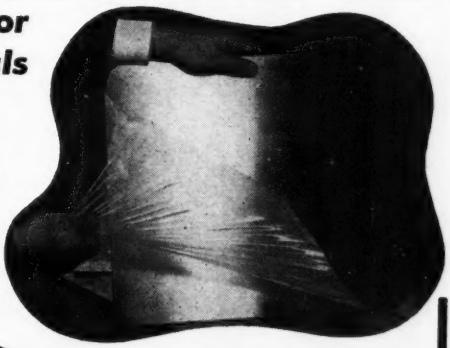

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New raw materials for the protective coating and other industries have been developed by W. A. Jordan and his associates at the General Mills Research Laboratories. Details on these improved materials, called "Modiphats," are given in "Progress thru Research" (3:1, Fall, 1948). One of them, Modiphat 145, is formed by reacting the rosin fraction of tall oil with glycerine. Modiphat 145 is a pale-colored, semi-solid, plastic material. Because it is tacky, stable, unaffected by humidity changes and because it has a solubilizing action on many other organic materials, it is potentially valuable, not only to the producers of synthetic coatings, but also to the manufacturers of adhesives, soaps and synthetic rubber compounds.

Thus, in combination with lime and mineral spirits, Modiphat 145 forms a high quality gloss oil used in metropolitan, barn and interior flat paints. With calcium acetate, China wood oil, mineral spirits and various driers, this glycerine-utilizing compound also forms a fast-drying enamel vehicle. Important potential uses are also seen in the fact that Modiphat 145 is not only tacky but retains its tackiness even when mixed with other polymeric materials. In combination with certain styrene polymers, the material forms an adhesive that seems ideal for surgical and masking tapes, mainly because it is dry and sticks firmly, yet is easily removed. The tackiness of Modiphat 145 also adapts it for use in soft rubber rollers and gaskets. Its low cost gives promise for use in liquid sanitary soaps, dry cleaning soap and soap chips.

CATALOGS

FOR YOUR LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Rack Coating

A four-page bulletin prepared by United Chromium, Inc., 51 E. 42nd St., New York 17, N. Y., describes Unichrome Coating 218.

2. Precious Metal Plating

A 16-page booklet issued by A. Robinson & Son, 131 Canal St., New York 2, N. Y., presents in usable form accepted methods applied in the electroplating of such articles as watch cases, insignia, jewelry, novelties, pen and pencil parts.

3. Buffs

A four-page bulletin published by The Manderscheid Co., Dept. 101, 810 Fulton St., Chicago 7, Ill., illustrates and describes bias type, loose, concentric sewed, radial sewed, spiral sewed, and other buffs.

4. Dust Collectors

Designated as the No. 31, a 24-page catalog illustrative and descriptive of its line of dust collectors and allied equipment for carrying away dust-laden air around grinding, cutting, and polishing wheels is now being distributed by the Torit Manufacturing Co., 314 Walnut St., St. Paul 2, Minnesota.

5. Zinc Anodes

A four-page folder describing "Flat Top" zinc anodes may be obtained from Wagner Bros., 431 Midland Ave., Detroit 3, Michigan.

6. Strippable Plastic

Technical Data Bulletin No. T504, describing Copeel Strippable Plastic Coating, is being issued by the Maas & Waldstein Co., Newark 4, New Jersey.

7. Backstand Idler

An illustrated leaflet descriptive of the Niederst Backstand Idler for use in performing belt polishing operations using present lathe equipment is now available from the Niederst Co., 3506 S. Michigan Ave., Chicago 15, Illinois.

8. Tumbling

"Precision Tumbling with Alundum Abrasives" is the title of a booklet of interest to finishers of metal or plastic parts which is now being offered by the Norton Co., Worcester 6, Massachusetts.

9. Finishing Systems

Complete details on the entire line of Newcomb-Detroit finishing systems is contained in a catalog prepared by the Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Michigan.

10. Abrasive Belt Machine

Bulletin No. 19 now available from Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich., illustrates and describes the Hammond Abrasive Belt "50," a unit for performing grinding, polishing, deburring, and cleaning-up operations.

11. Organic Coatings
The Liquid Plastics Division, Ferro Enamel Corp., Cleveland 5, Ohio, is issuing a bulletin, "A Review of Product Finishing with Organic Coatings."

12. Spray Finishing Equipment
Catalog No. 97 prepared by the Binks Manufacturing Co., 3114-40 Carroll Ave., Chicago 12, Ill., contains complete data on spray guns, spray booths, air compressors, painting outfits, extractors, respirators, hose, and other products.

13. Conveyor Belts
A reference book presenting illustrations, engineering specifications, design and construction details on belts for the conveying and treatment of industrial products is now being offered by the Cambridge Wire Cloth Co., Dept. H, Cambridge 1, Maryland.

14. Cleaning Machinery
An illustrated folder descriptive of its complete line of machinery for washing, rinsing, and drying metal parts is now being offered by the Cincinnati Cleaning and Finishing Machinery Co., Ironton, Ohio.

15. Metal Degreasing
The Chlorine Products Division, Electrochemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del., has issued a 10-page illustrated booklet outlining standard practices for the degreasing of metals with chlorinated solvents.

16. Abrasive Belts
"A Faster Better Finishing Method," a booklet showing how the 3M wet grinding method is reducing production time and costs in many lines of industry, is now being distributed by the Minnesota Mining & Manufacturing Co., St. Paul 6, Minnesota.

17. Flock
The Behr-Manning Corp., Troy, N. Y., is now offering a color guide and information booklet on rayon precision-cut flock for application to metal, wood, glass, plastic, cloth, or paper.

18. Spar Varnish
Standard Varnish Works, 2600 Richmond Terrace, Staten Island, N. Y., is offering a booklet describing "1000 Spar" Varnish.

19. Spray Booth Coating
A folder detailing application methods and advantages in the use of a strippable plastic spray booth coating is being issued by Ramsell Products, Inc., 712 S. 5th Ave., Maywood, Illinois.

20. Metal Preparation
Bulletin 48-89 descriptive of a pre-paint surface treatment for zinc or cadmium surfaces is available from the Neilson Chemical Co., 6561 Benson St., Detroit 7, Michigan.

21. Organic Finishing
A 12-page technical bulletin outlining basic points to be considered in the planning of a complete organic finishing system has been prepared by Peters-Dalton, Inc., 17908 Ryan Rd., Detroit 12, Mich.

22. Cleaners and Paint Strippers
Six technical bulletins describing paint strippers, cleaners, and phosphate coating materials are being distributed by Chemco Products Co., Inc., 1059 E. 76th St., Chicago 19, Illinois.

23. A.C. Generators
A bulletin describing the construction and operation of Columbia alternating current generators is being issued by the Columbia Electric Manufacturing Co., 4519 Hamilton Ave. N. W., Cleveland 14, Ohio. Construction features and operating characteristics are described and available sizes and ratings listed.

Print plainly in filling out coupon for literature.

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